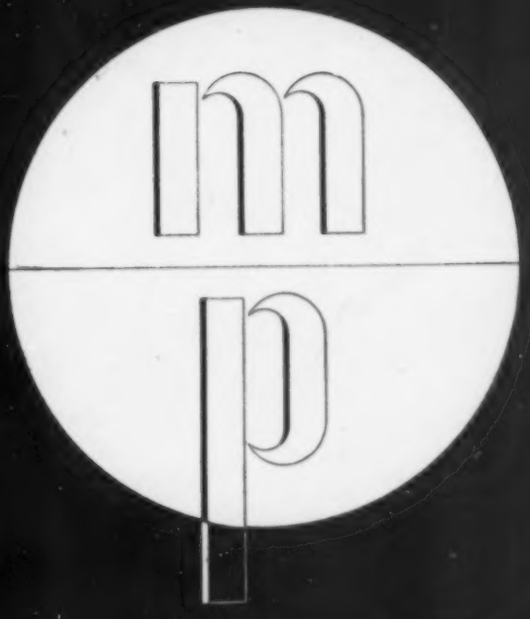
MODERN PLASTICS



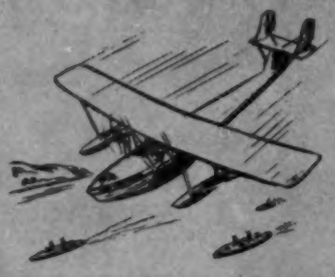
JULY 1935

Pioneer switches from metal to DUREZ for aviation instrument cases . . . .

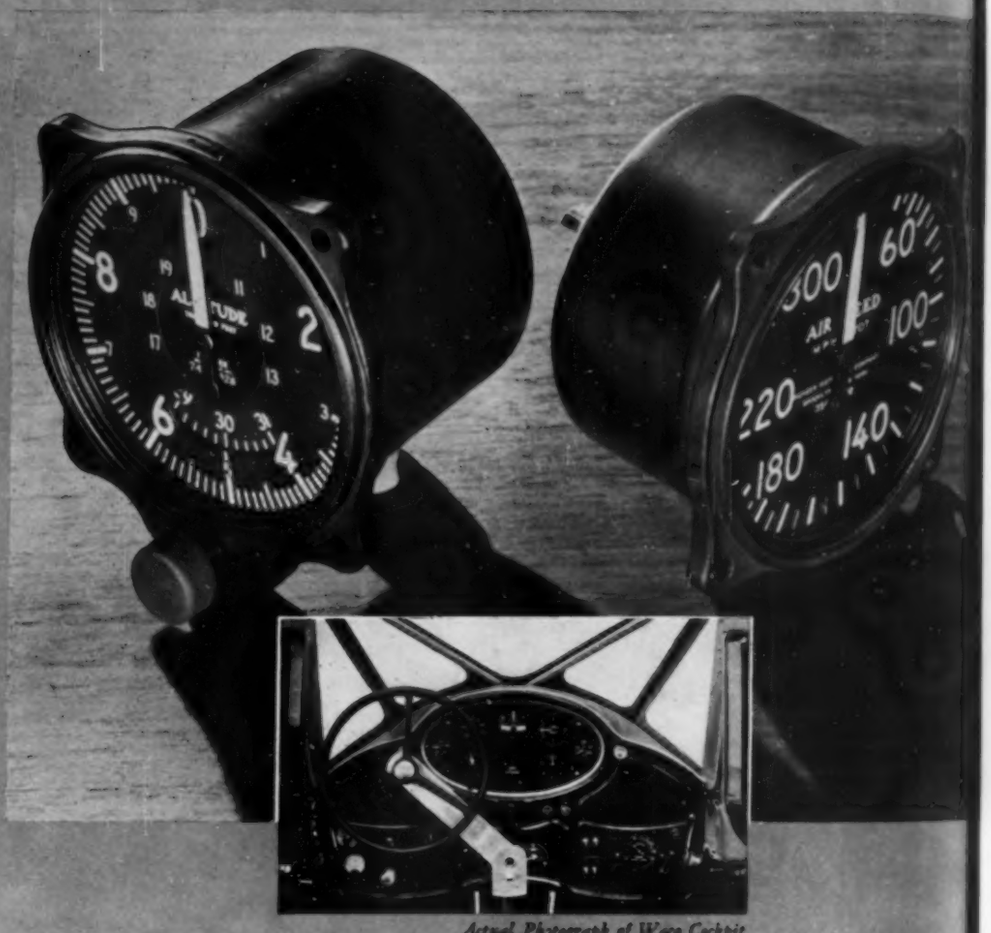
ECONOMY: They come right out of the mold completely finished . . . eliminating special oxidation and enamelling processes necessary on metal cases.

STRENGTH: Durez cases withstand 3000 vibrations per minute on this testing machine which reproduces vibration conditions of actual flying. Each mounting lug must stand a breaking pull-test of 175 lbs.

CORROSION RESISTANCE: The delicate instrument mechanisms are protected against corrosion . . . the hard durable finish of the Durez cases is not affected by salt, atmosphere or changes in temperature.



● Pioneer also tests all instruments through a temperature range of −40°C to +40°C. Durez cases meet expansion and contraction requirements perfectly.



Actual Photograph of Waco Cockpit

THE Pioneer Instrument Company organized in 1919 was the first compan to manufacture *only* aeronautical instruments. Their equipment has bo long noted for its precision and durability. Today commercial, governme and privately owned aircraft fly with Pioneer instruments.

Durez has the durable finish, strength, chemical inertness, resistance to he and moisture, and dielectric qualities suiting it to the widest range of product Write, telling us what you make, for booklet "20 Applications" with su gested product improvements with Durez. General Plastics Inc., 357 Wal Road, North Tonawanda, N. Y.

DUREZ THE MODER MOLDING COMPOUN

JULY 1935

VOLUME 12 NUMBER 11

MODERN PLASTICS

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Success story . . .

FOR BAUSCH AND LOMB, FOR PLASTICS AND FOR AUBURN

In the great Bausch & Lomb Laboratories, a new eyewear construction has been perfected. It is a method of mounting rimless lenses without screws, called LOXIT. This is an innovation that has great appeal to spectacle wearers, because now, with no screws to cause strain in the glass, rimless spectacles won't break so frequently. However, each of the four Loxit straps (where glass and metal are joined together) is so tiny that demonstration of the Loxit principle has been exceedingly difficult.

It was decided to provide eyesight specialists with an enlarged model of a Loxit strap, to aid them in demonstrating this new method of screwless eyewear construction to their patients. Obviously, it was essential that such a device should be as accurate in its enlarged size as the original, that it should be of fine appearance, and that it should be non-breakable and long-lived.

Bausch & Lomb, having worked with Auburn in the solution of dozens of other molding problems, presented the LOXIT problem to our engineers. Their solution called for a transparent acetate sheet, to represent the lens; a grey acetate rivet (placed in position and molded so as to prevent removal from the hole while allowing for the necessary motion within the hole) and finally two yellow acetate locking bars each molded to provide a perfect grip from the rivet.

The finished demonstrator is now in the hands of thousands of eyesight specialists, making easy their selling job and creating good will and sales for the company. Once again, Auburn design, Auburn engineering and Auburn molding skill have been combined to produce an outstanding merchandising success.

* * * *

What Auburn engineers have done for Bausch & Lomb, and for many others among America's leading firms, they can do for you. Backed by long years of experience and one of the finest plants in the country, they stand ready to aid you in devising molded parts of products that will bring you lower cost, better sales or both. Investigate. Write—

Auburn Button Works Inc.
Auburn, N.Y.

JULY 1935 VOL. 12 No. 11

MODERN PLASTICS

BRESKIN AND CHARLTON PUBLISHING CORP.

THE MOLDED CAMERA COMES OF AGE

IT is a curious fact that molded electrical switches have been commonplace for over twenty years, while molded cameras have only within the last year and a half come into prominence. For both present exactly the same problems to the designer and manufacturer. Both are fairly intricate jobs which combine molding with metal inserts. Both require long wearing, highly finished outer surfaces. Both require strength to resist impacts and stresses. Both are essentially mass production items.

Yet, in the case of electrical switches—largely because of the one added factor of insulation—molding was readily and speedily accepted. In the case of the camera, where molding offered numerous advantages but no single dominant one to compare with insulating qualities, progress has long been retarded.

So much so, in fact, that molded plastics first climbed in through the back window, as it were . . . in the flood of fifty-nine cent and thirty-nine cent cameras which

began about two years ago. Here, considerations of size and cost led to a type of extremely simple design, without great flexibility or many adjustments. Design permitting comparative ease in molding, mass production requirements *demanded* this process. For only through the molding process with its one-operation finishing of parts, could speedy and large production be secured.

In the growing sales of these midget cameras, limited though their utility was, the makers of standard types found a threat. For consumers not only demanded less of cameras produced at thirty-nine cent prices; they likewise began to question the values of two and three and four dollar cameras of seemingly less sturdy construction and inferior appearance.

Partly to meet, partly to anticipate this threat, Eastman-Kodak called upon Walter Dorwin Teague to produce a camera design calling for molding. This, as finally marketed, was far in advance—in appearance and construction—of the original molded cameras. It retailed in the eighty-five cent to a dollar range . . . and sold in great volume.

Yet both this and its predecessors were within the midget camera classifications—good enough for beginners or children but hardly suited to the requirements of even the less advanced photographic amateurs.

Now, capitalizing the knowledge of design requirements and consumer likes and dislikes, in regard to molding, which they gained through the midget camera experience, Eastman has produced its first standard size film camera of molded construction. Known as the Jiffy Kodak V. P. (meaning Vest Pocket) this is of the automatic expanding bellows type with a molded case and molded lens frame and plate. The case, molded in black in two halves, measures $2^1/_2$ inches by $5^1/_2$ inches by 1 inch. The halves lock together, after insertion of film, by means of a metal slide attached to the top of the forward half by small screws. Light-proofness is obtained through the use of molded-in tongues and grooves at all points of contact between front and back halves. An eye-level range finder is attached to the side of the case by means of two small rivets. The lense frame and so-called "action front" is mounted upon a metal box housing the shutter and lense-adjusting mechanisms. It is of smooth construction, consisting of four slightly beveled planes radiating from the round lens aperture. The case itself has smooth sides and vertical striping molded into the front and back surfaces.

As an indication of the wide public acceptance of molded cameras—induced by their experience with the smaller molded cameras as well as public familiarity with molded objects in other fields—we find Eastman featuring the Jiffy Kodak in its *Saturday Evening Post* and other advertisements. A typical advertisement reads, "Check these new Kodaks against your old camera." Both the molded case itself and the modern styling made possible by the case are featured in copy and illustration while non-molded models are distinctly subordinated to the molded design.

THE SATURDAY EVENING POST
MODERN STYLING
ACTION FRONT
Check these new Kodaks against your old camera
KODAK SIX-20 (below)—America's most popular fine camera—rich in appointments, with etched side panels and chromed parts. Its keen f/6.3 lens makes snapshots at night with "SS" Film and Photo-flood bulbs... its 1/100-second shutter gets children "on the go." Both eye-level and reflecting finders. For 2¼ x 3¼-inch pictures, $17.50. Other models from $14.
KODAK JUNIOR SIX-20, f/6.3 (above)—is offered at a remarkably low price for such fine lens and shutter equipment. The Kodak Anastigmat f/6.3 lets you make snapshots when you'd ordinarily put your camera away... on dull days... in the rain... AT NIGHT with Kodak "SS" Film and Photo-flood bulbs. Has both eye-level and reflecting finders. Three shutter speeds. Makes 2½ x 3¼-inch pictures. Costs only $18.50. Other models, $10 up.
LIKE ANY OTHER SPORT, picture taking depends a lot on the equipment. Yet many people are still using cameras that were back numbers years ago.
Old models simply don't measure up to 1935 standards. Put yourself behind one of these new Kodaks and you boost your skill about 100%.
Lenses and shutters are better than you could ever before buy at the price. There's more convenience all around. Just look at the features.
Picture-this modern world with a modern Kodak—this week-end. Your dealer has the camera you want. Kodaks from $5 up; Brownies as low as $1... What else will bring so much lasting enjoyment?... Eastman Kodak Company, Rochester, N. Y.... Only Eastman makes the Kodak.
JIFFY KODAK—It works so fast it had to be called "Jiffy." Touch a button—"Pop"—it opens. Touch another—"Click"—it gets the picture. Focuses for near and distant subjects. There's extra smartness in its etched metal front and leather-like finish. Jiffy Six-20, for 2¼ x 3¼-inch pictures, $8. Jiffy Six-16, for 2½ x 4¼-inch pictures, $9.

PLANNING AHEAD

with GILBERT ROHDE

by E. J. Lougee

THOSE designers not born of the depression but whose work was well under way before that unhappy situation was brought about, have the advantage of well-grounded ideas. They were pioneers in what seemed at the time a rather futile profession. Manufacturers in general were well pleased with their products and sales indicated no startling change in preference among those who bought them.

Gilbert Rohde

Gilbert Rohde was born in New York and at the age of ten became interested in electro-chemistry. He began his designing career by copper plating his mother's silver spoons. Gilbert was scared, but mother smiled and said she liked them much better that way.

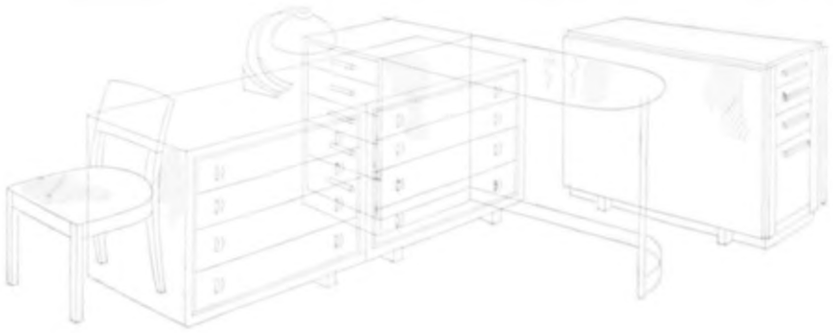
Thus encouraged he studied fine arts at the Art Students' League, then did advertising illustration, specializing in interiors which developed his taste for objects of homefurnishing.

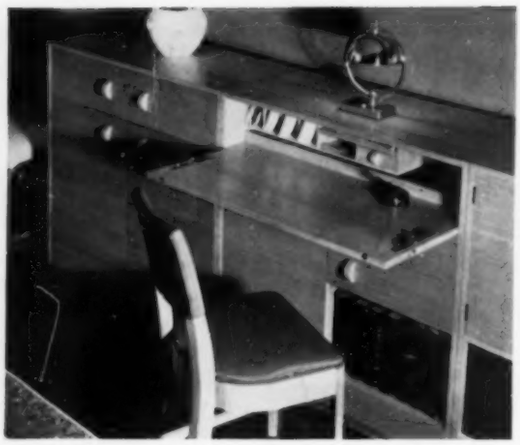
His natural bent was toward engineering and mechanics rather than art, and for a time he felt that he should have been an architect. In 1926 he went to Europe to get ideas and returned with some very definite notions of modern decoration for interiors which he translated into being with moderate success. Among them were metal tables with plastic tops.

In 1931, he attended the Colonial Expositions in Paris and the Bau Austellung in Germany and returned this time with a fixed determination to enter the field of industrial design which was then in its infancy.

His success is predicated upon his individual make-up of desire, training and experience—one-third engineering, one-third artistic, one-third advertising and selling.

He has successfully designed many things but his outstanding achievements have been generally identified with homefurnishings and interiors.





Any radical change in product design in those days was obtained only through tremendous mental and physical effort which the designer had to exert upon presidents, vice-presidents and other members of the board, with a result that his enthusiasm as well as his patience was often evaporated in the process and nothing accomplished. Besides ideas and an unwavering faith in them, the designer had to have a rugged enthusiasm and a heap of persistence to gain even a hearing with those in authority.

The progress made by industrial design during the past few years has given pioneer designers a splendid opportunity to test the soundness of their original ideas. They have had a chance to see them develop in importance. Industry is no longer unwilling to listen to their plans and discuss them.

Design has reached the point in modern merchandising and selling methods where its importance cannot be ignored. At the first sign of falling sales, a manufacturer is more than likely to turn his attention to the appearance of his product and its package. He would never have thought about this ten years ago.

What these designers think of the future therefore is worth considering seriously. Gilbert Rohde is one of them. His first acquaintance with plastics was in 1926 when he began manufacturing tables of modern design from tubular metal with plastic tops. He made them to fill a definite decorative need and could find no manufacturer willing to make them for him. He was encouraged by the Formica Insulation Co., which showed interest in his work and supplied single table tops for his experiments at the same low price he later paid for them in hundred lots.

"The best friend of the plastic industry," says Mr. Rohde, "is the designer who recommends the use of plastic material only where he knows it will be financially successful. One false suggestion for an untried use jeopardizes the reputation of both the material and the designer."

In order to get a true picture of the future of plastics so its makers, molders and fabricators can lay intelligent plans, these gentlemen must try to understand the motives and machinations behind this rapidly changing era of progressive growth.

"Perhaps one of the most promising developments of the moment is the matter of housing where plastic materials can enjoy tremendous growth," declares Mr. Rohde with emphasis.

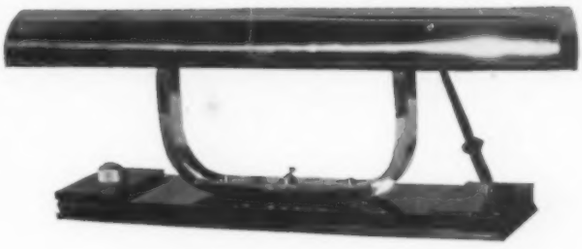
Sixty per cent of our population live in sub-standard homes, not because they wish to, but because they can afford to live nowhere else. Class magazines and newspapers constantly picture the comfort and luxury enjoyed by the 25 per cent of our population who do not have to count costs when they choose their homes. The remaining 75 per cent to whom costs are vital will quickly consider any approach to this luxury which is presented within their means.

The prefabricated house indicates the logical solution. If you will compare what the public gets for its money as a whole, as represented by recent examples of the prefabricated house, with what it has been getting with contract methods of building, details won't be too finely considered. Anyone who has taken the time to examine one of these homes has probably found many faults in its plan and construction. Even its makers do not claim perfection, but it is a start. It represents the

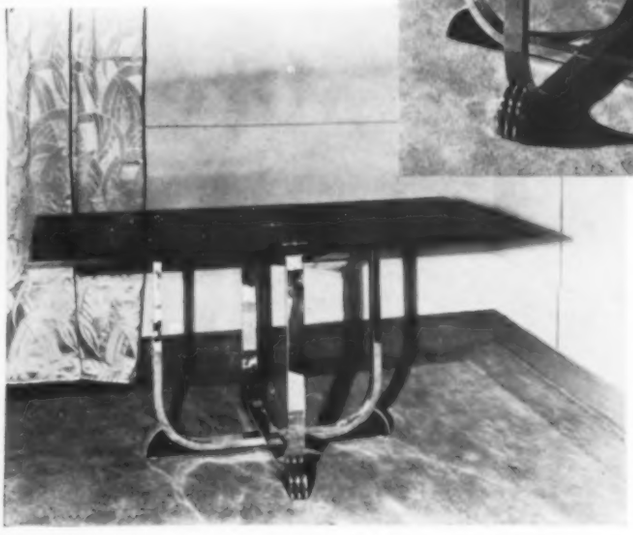
This furniture is now made of wood but the forms are such that they could well be made in some sort of molded material if and when materials suitable to large objects are developed. Furniture such as this is now being made and sold on a large scale and is preparing consumer acceptance for forms this type

beginning of a new era in which the public will get what it really pays for or it will not part with its money at all. Economics and social values must be considered in a broad way before we consider likes and dislikes of mere detail in design.

If we contrast the approach of the old industry of wood to the new industry of plastics, we see the difference is due as much to the psychology of the industry as to the designers. Far greater efficiency is available in the wood industry but our imagination indicates illimitable advantages in plastics that do not exist in wood, once they are sufficiently advanced to practical use. Plastics when they are available in usable form, will remove limitations of fitting and finish. They will supply all that wood and other materials lack in insulative and fire resistant values. Desired colors will be attained without wet work or delay.

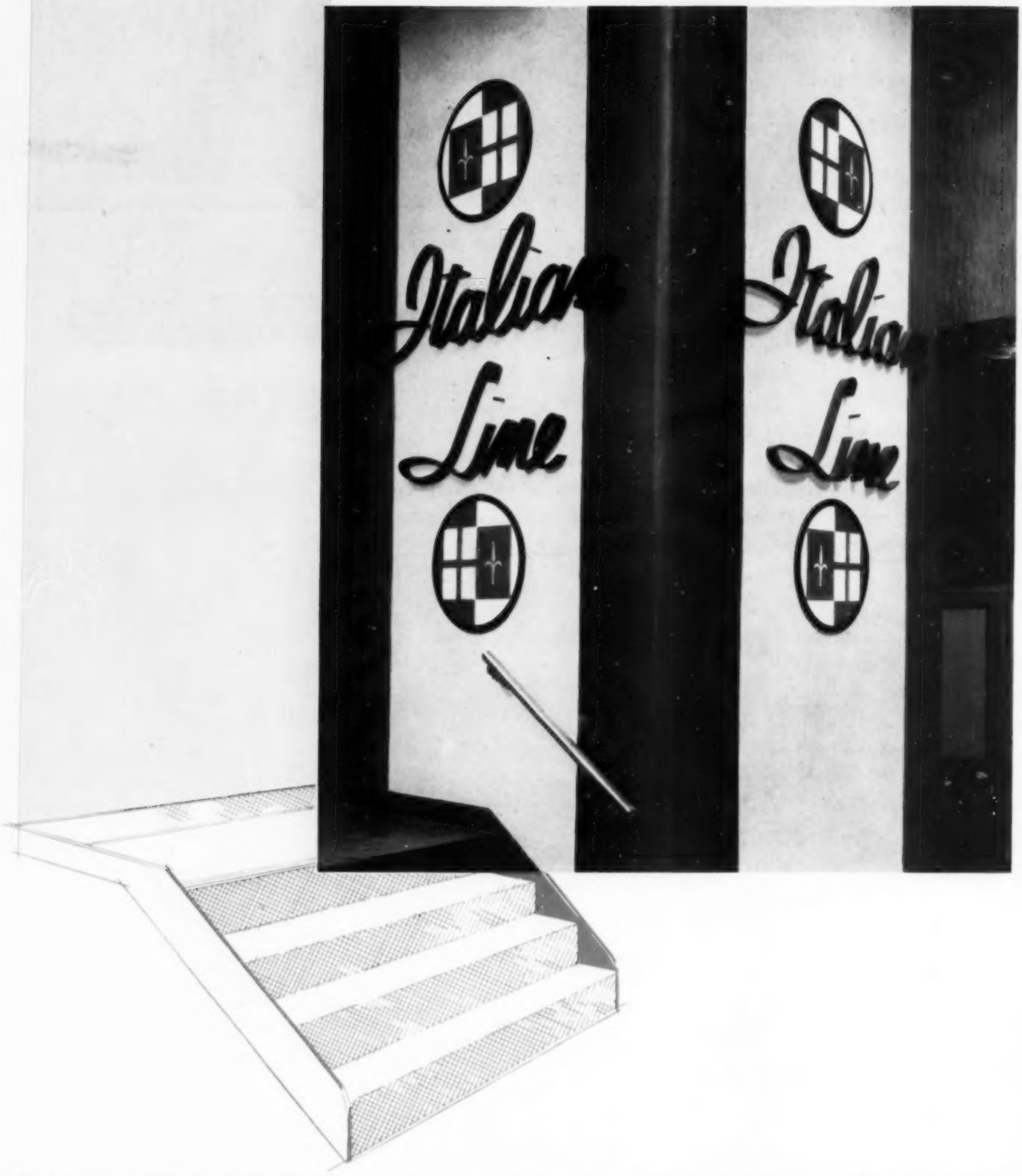


Early examples of Gilbert Rohde design which convinced him that plastics were ideal for homefurnishing and decorating but that their practical use was dependent upon consumer acceptance of established forms which could be fabricated in mass development. He believes that time is close at hand



The prefabricated house represents infinitely more value per dollar expended than any home ever built under the contract system. There is no comparison in actual value—dollar for dollar cost. These homes complete cost less than a contract house, in a good neighborhood, depreciates the first month it is occupied. Even in its present crude state, the prefabricated house represents a marvelous progress for those who must live—it brings the advantages of a real home within the reach of those who can afford to buy. It is the beginning of an idea in prefabrication.

When the pattern is cast and (*Continued on page 56*)



FOR BEAUTY AND FOR PERMANENCE

STEP by step, the cast phenolics are achieving greater usage in the field of building decoration. The process is painfully slow—partly because of the depressed condition of the construction industry itself and partly due to a natural hesitancy on the part of architects and investors to place large installations before other jobs have had several years of time-testing.

Yet, this hesitancy is being gradually overcome as, one by one, borderline installations are made—by a process of "translations" as it were. Thus the translucent qualities of cast resins led to their adoption for the elevator lighting cabs in Radio City. And thus, today, their established usefulness in display and sign manufacture has led to the use of cast plastics in a decorative installation in the new offices of the Italian Line, in the Italian Building of Rockefeller Center.

These offices occupy a small, ground-floor, corner store and a larger area im- (*Continued on page 60*)

CLEAN CONVERSATION

THE question of the need for telephone sanitation is a debatable one. Most telephone company officials decry the possibility of infection arising from this source. Other authorities condemn all telephone mouthpieces as germ and disease spreaders of the first order. Yet, whether the need be real or imaginary, it cannot be denied that there are a great number of people who ascribe the spread of colds and other infections to this source. For such people, some means of antisepsis is a personal, though possibly imaginary, necessity—one which has called forth a number of devices, in recent years, of which the "Hygen-O-Phone" is the latest and, from the point of view of ingeniousness, among the best.

The Hygen-O-Phone, marketed by the Phone Appliance Corporation, is essentially a device for isolating that section of the telephone which comes into close contact with the mouth, and for sterilizing this isolated section. To achieve sterilization, a germicidal disk is used. This gives off a gas, which, according to laboratory reports, possesses sufficient germ destroying powers to keep the mouthpiece sanitary.

The problem in designing the device, therefore, resolved itself into one of providing sufficient air circulation to spread the gas throughout the sanitized section, while simultaneously preventing dispersion of the gas throughout the room. To achieve this end, three molded phenolic parts were combined. First, a base fitting over the standard telephone mouthpiece; second, a new mouthpiece which screws onto the base, holding the germicidal disk in place between the two; and third, a hinged door which is closed when the telephone is not in use, thus providing the necessary restricted area for the sanitizing gas.

Each of these pieces provides a number of interesting molding problems, which—while not unusual—are nevertheless seldom all encountered in a single molding job. The base contains three spring clips, providing a tight attachment to the standard telephone mouthpiece. These are held in place by small rivets, passing through horizontal holes in the molded piece. A screw thread provides the joint between this section and the mouthpiece proper, which is placed at an angle calculated to maintain the same distance between transmitter and receiver as is found in the original telephone without this sanitary mouthpiece attachment.

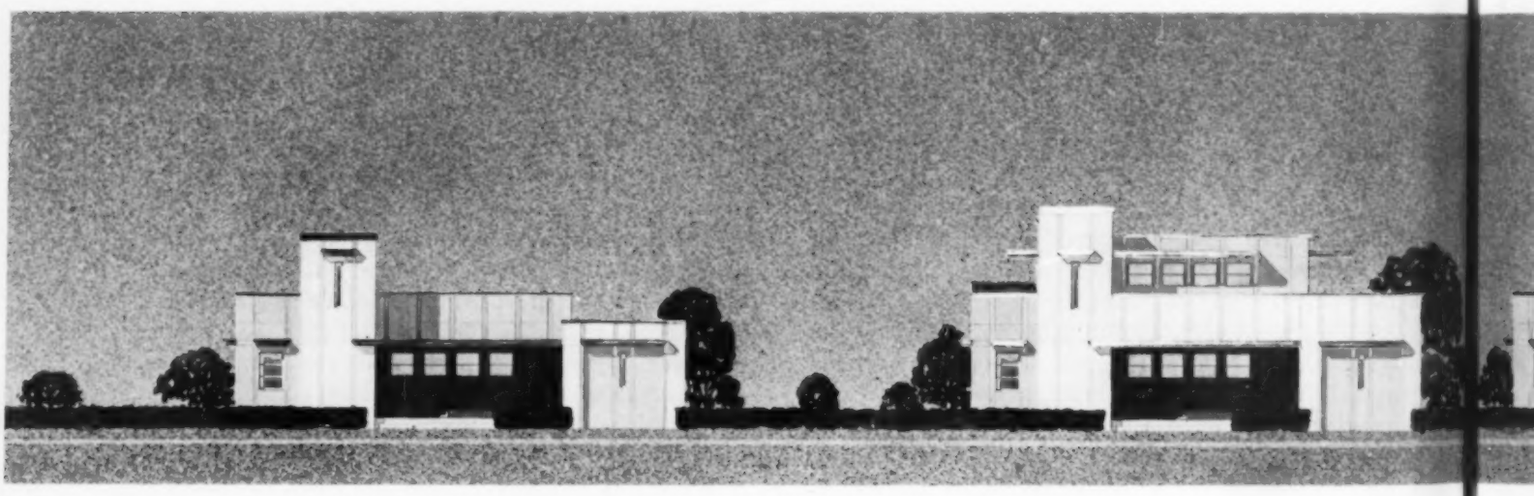
The mouthpiece, in addition to the customary holes for the passage of sound waves, contains a large group of similar holes through which circulate the dispersing gases. At one side are found three lugs which form a portion of the hinge attaching the mouthpiece to the cover plate. The plate itself has a spring catch, molded as an integral part of the piece, which holds it in closed position until, with a flip of the finger, it is opened for use. Two small lugs, on the under side of the cover, prevent complete contact with the mouthpiece. Thus a slight circulation of air is assured, making certain that the rising gas will circulate into every section of the device. (*Continued on page 61*)

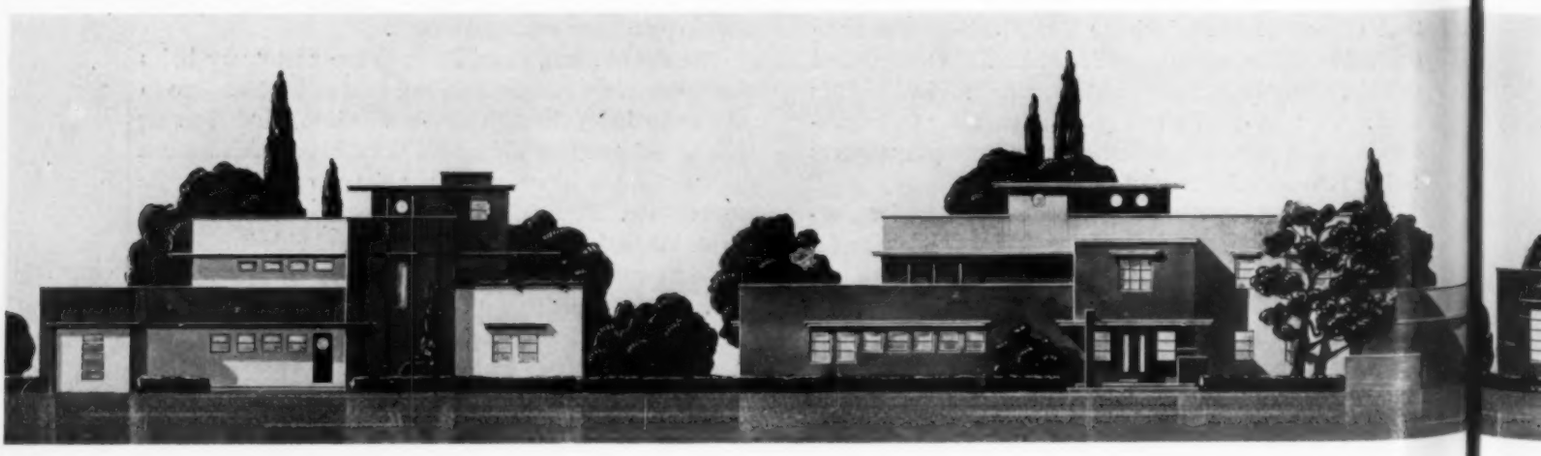
Seeing the READY-MADE HOUSE

SINCE Harvey Wiley Corbett feels that social and scientific trends must logically arrive at the prefabricated house, his valuation of synthetic plastics as building materials is gauged by their suitability for that use. As he points out, there is one—and only one—unexploited field of architecture, that of the private house for those who can only afford $5000 and under as their budget. This large economic class has never been housed, it has lived and is living, in second hand housing discarded by the higher income classes. In terms of real value, it has paid an unfair proportion of the total cost of this housing.

There exists therefore a potential market of efficient housing for the masses comparable to that of supplying them with automobiles. Since the basis of profit in automobile manufacture rests on mass production of identical units—the only method of production which can bring an article of expensive design within purchasing range of the masses—similarly, housing for the masses can be made profitable by employing such a method, and employing those materials which are most suitable for it.

It is possible to supply the masses with automobiles because their manufacture has been organized to effect the greatest possible economy of time and labor in assembly. The basis of this organization is the prefabrication of standardized units. At the present time the assembly cost of a popular automobile model is .007 of





with Harvey Wiley Corbett

by Dock Curtis

Harvey Wiley Corbett

its cost. In contrast, the present assembly cost of housing is 60% of the total. It would seem reasonable to assume that by applying the same organization of manufacture to housing as is used in automobile manufacture, the cost of a house can be reduced by 50%. To make one of a $600 automobile to order would cost $60,000. Consider the cost of a house in that light!

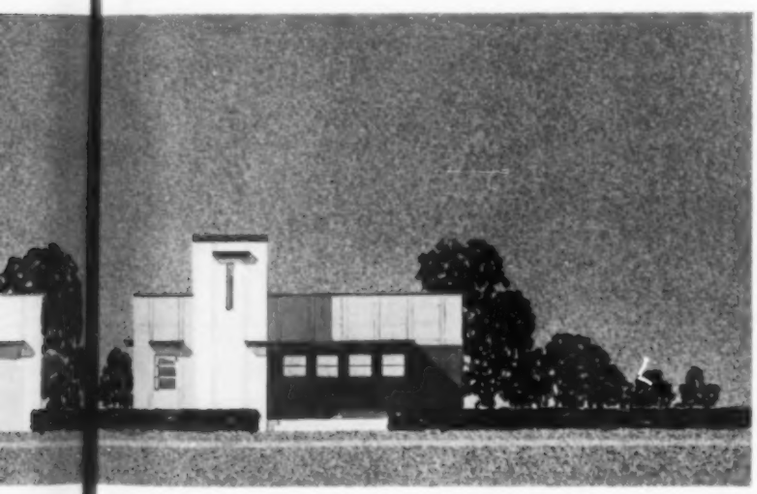
Once demonstrated in low cost housing, the same principles of construction can be applied to commercial and institutional building. At present the red tape involved in changes of the building code is discouraging to any radical experimentation.

The basis of the particular plan for prefabricating houses now being developed by Mr. Corbett is construction in jointed steel units from a series of parts of standardized shapes and sizes, prefabricated and delivered to the site completely finished and there assembled. Assembly of the typical $5000 house ($5000 by present custom) is possible in three or four days.

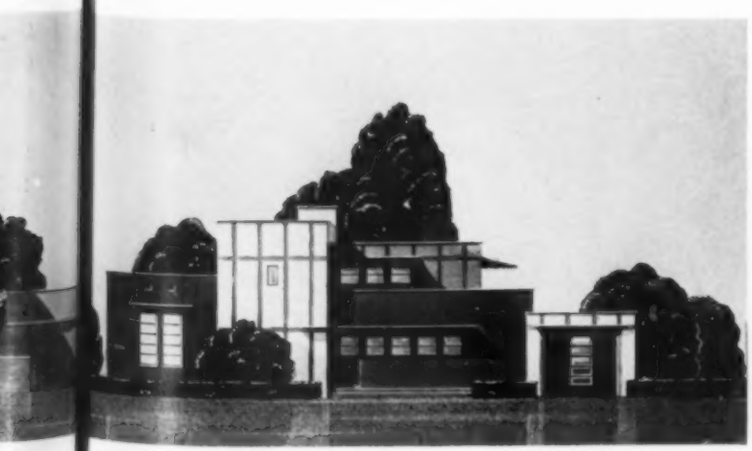
The prospective home buyer is supplied with models of the typical units and a schedule of the prices of each. He can then design his own house on the dining room table. The home buyer can therefore determine exactly what his house is going to look like and what it is going to cost him, before he orders it.

Having purchased the side and presented his plan and specifications, the buyer is then instructed to bring water, gas, electric and sewage outlets to a specified point in the plot and a certain number of inches above ground. Within three weeks the house is delivered in the form of a truckload of parts. Within three or four days more, the house has been assembled and the gas and electricity turned on.

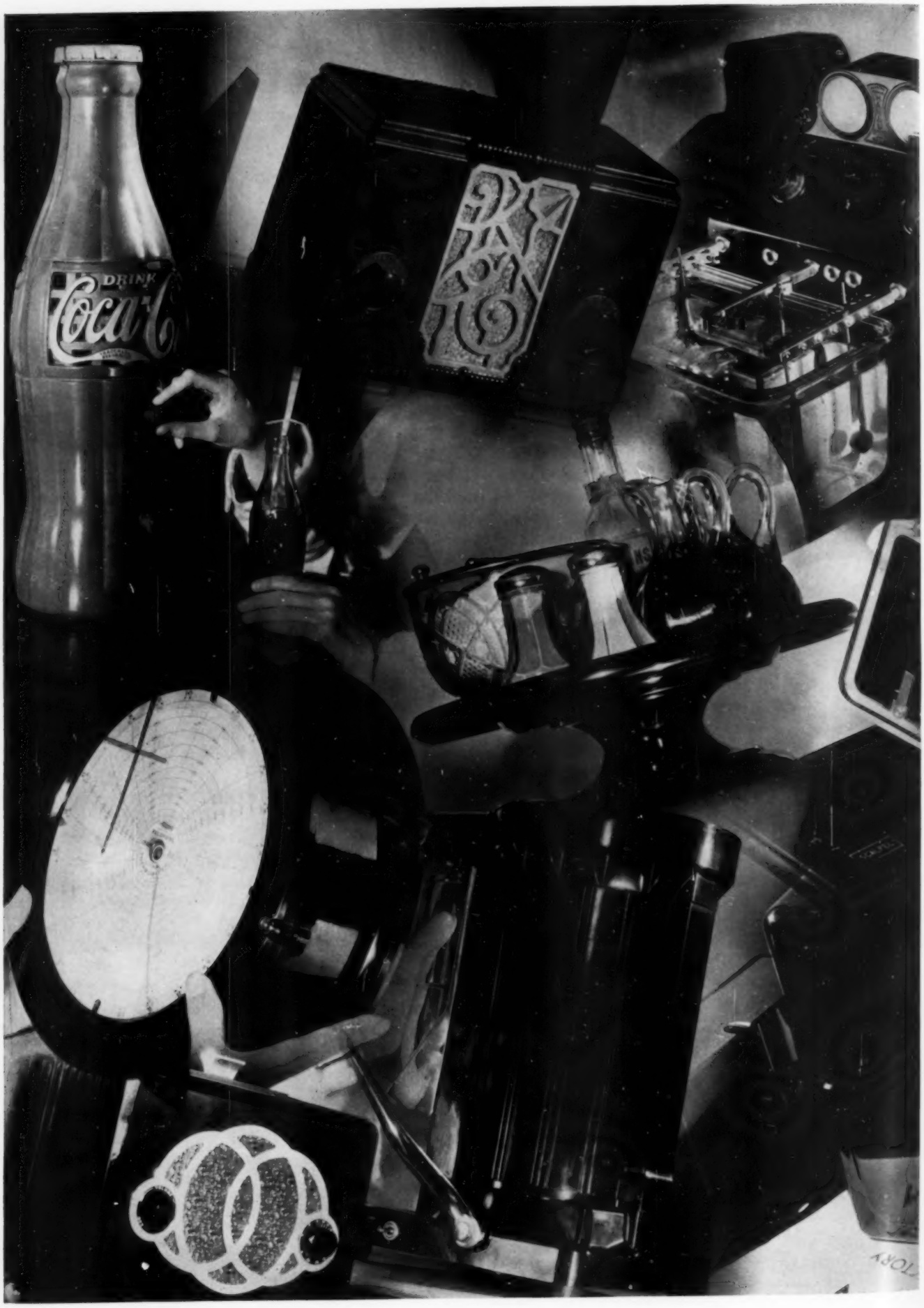
There is no basement nor are there any stone foundations. What is called a power (*Continued on page 49*)



Top—How the prefabricated house can be made to grow. At extreme right is a small unit. When the family acquires a car, a garage is added, as at the left. The center sketch shows the addition of a second story



Below—Prefabrication offers opportunities for the use of color as a medium of design which fit nicely into plans for using synthetic materials—particularly plastics. These exteriors show the possibilities of mass treatments of color. Even greater opportunities for plastic color treatments will be found in interiors


DRINK
Coca-Cola

MOLDINGS GET LARGER

by Franklin E. Brill
GENERAL PLASTICS, INC.

HOW large can you mold a phenolic piece? Does molding material have enough strength for large pieces? Are large moldings more costly than enameled metal stampings or castings? How thick must the walls of a large molding be made? What kind of large parts lend themselves to molding?

Manufacturers planning large structural moldings would naturally like a general rule to cover each of these questions, but each large molding is really a separate problem. Still, we can lay down a few guideposts: we can say that present equipment permits molding pieces up to 12 inches deep by 36 inches long, and that present phenolic materials have adequate strength for moldings of this size unless subjected to unusually rough treatment. As for relative cost, moldings are usually more expensive than simple metal pieces, even when enameled, but when intricate one-piece moldings can eliminate assembly or machining operations, costs are more often competitive. The walls of large phenolic moldings should be roughly $^1/_{48}$th of the depth of the piece, to permit filling out, unless extra rough usage dictates thicker and stronger walls.

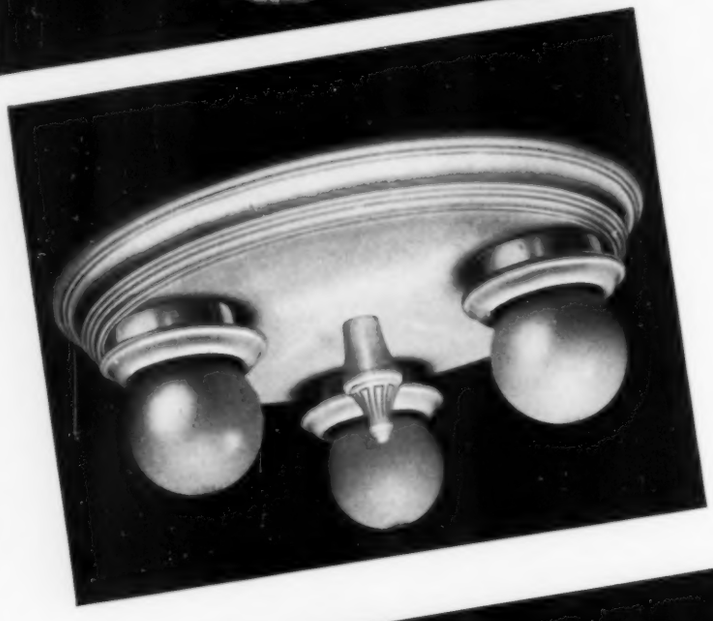
Here your general rules end, and you must look for guidance to previous moldings similar to the one you're planning. Glance over the larger phenolic moldings in the illustration on the opposite page. That giant Coca-Cola bottle is a radio cabinet, too feet high, molded in two pieces of red phenolic plastic to simulate the colored beverage. The tall cylindrical machine is a soda-fountain whipper 16 inches high, molded in three pieces with a $^1/_6$-hp. motor mounted inside. The round recording instrument case has a hinged cover and is 14 inches in diameter, with rather thick walls to stand very hard usage. The satchel-shaped molding is a one-piece case for a portable dental electroplating unit, 12 inches high, with instrument housings and bezels molded integrally. The restaurant table server, the radio cabinets and the other pieces are all quite large and have to stand hard usage, but they are all successful moldings.

Actually, the maximum size of a plastic molding is limited only by press size and pocketbook, and given larger presses, sufficient capital and thicker sidewalls, we could be molding bathtubs, oil-burner housings and water-cooler cabinets. But here other factors enter—factors of relative cost, strength and mold capacity. Since plastic molds are more expensive than metal stamping dies, a very large mold is apt to cost so much more than a stamping die that the stamping could be carefully enameled and still cost less than the molding, except perhaps in cases of very large runs. Then too large pieces are usually molded in single-cavity dies which means that you can get only four to six pieces per hour from a mold, as against many more per hour from a stamping or casting die. This is overcome in molding small pieces by multi-cavity dies which increase the output of pieces per hour. Finally, impact strengths of phenolic materials—even though they are 100–300 per cent higher than five years ago—are still below metal, and phenolic moldings simply cannot stand the impacts that metal can. New phenolic materials now being developed may change this situation completely, however.

Just to make it more difficult, there are exceptions to these rules. Take a fairly recent case, for instance, when phenolic plastics were competing with a metal stamping for the job of housing a newly-planned industrial time-recording device. Ordinarily an engineer would say that the stamping could do the job cheaper and practically as well, but when the cost-estimates were laid out it was found that four separate dies were required to blank, form and punch the stamping and that they cost nearly as much as the single plastic mold which would also automatically finish the piece. The final cost of the molding was so near to the stamping that the wear-proof, chip-proof lustre of the molding finally swung the job over to plastics.

Right here is a good place to warn the engineer about developing a purchasing agent attitude in contemplating plastic moldings. It is true that intricate moldings which eliminate machining, finishing or assembly operations sometimes cost less than metal parts, but often the use of plastics will give a so much better product that even increased cost is justified. An instance of this is in the housing of the medium-sized or larger calculating machines. Suppose a phenolic molded housing does cost fifteen or twenty cents more than a japanned die-casting, the engineering and sales advantages will more than make up for it. It will be lighter in weight, non-resonant, amply strong, can be sculptured, engraved and trademarked automatically, and its finish won't wear, chip or dull—no matter how many times fingers or coat sleeves rub on the corners.

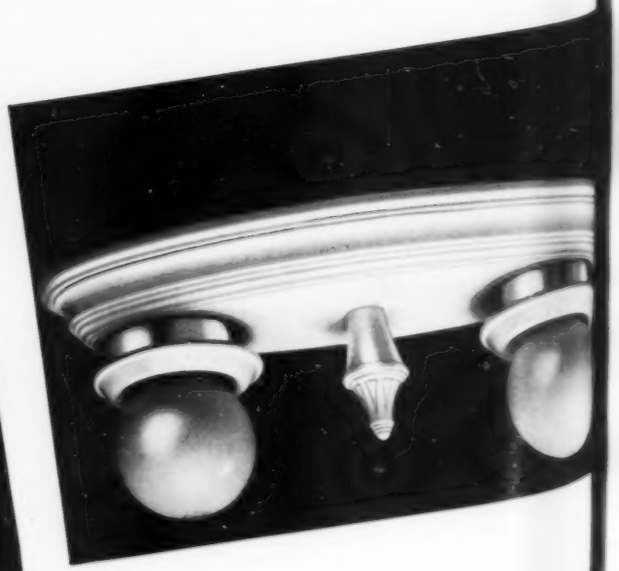
Perhaps a study of the large molded pieces in the illustration will help engineers in determining economical molding applications. The three-piece restaurant whipper mentioned above could be molded for about the same cost as for die-cast metal parts, largely because the metal parts required machining, scratch-brushing and enameling—whereas the molded parts required only removal of fins. What swung (*Continued on page 62*)



MOLDED LIGHTING

THE extinction of the chandelier and the extensive transplanting of lighting fixtures from the ceilings to the walls of living, dining, and bedrooms have brought plastics to the front as a most desirable material for such electrical devices. A year, or even six months ago, this would not have awakened great hopes in the molder or manufacturer of plastics. At that time no one could readily say that a decent sized market existed. But since then the alphabetical organizations such as FHA and HOLC have showered sums of money which will be spent in modernizing homes and building new ones. In the wake of these governmental angles a discussion of the new all-plastic lighting fixtures of the Waterbury Button Company may prove as profitable as it is timely.

It was the Waterbury Button Company who first realized that three separate circumstances had quietly set the stage for the entrance of a really complete line of plastic lighting fixtures. The idea was not by any means new as plastic reflectors have been in use for some time on the newer trains; and the Kelvinator shade for refrigerators is well known. Their claim to praise lies in their collation of these important facts: (1) That the great reduction in the size and style of home lighting fixtures brought the molder his first opportunity to do a comprehensive, economical job. (2) That interior decorators were unanimous in the desire to have the lighting fixtures of a room in conspicuous harmony



FIXTURES IN DECORATIVE PASTELS

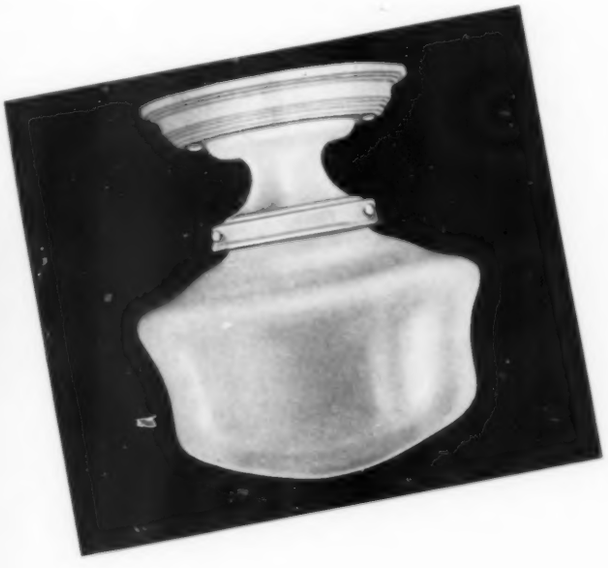
with their surroundings. (3) That electrical engineers, architects and builders have long known the fine durable and insulative qualities of plastics, and would gladly endorse the fixtures.

With these things, and that just-created market in mind and after three years of designing in large capacity tool building which terminated happily in the introduction of a new line of fixtures known as "*Pastel-Lite.*"

From every standpoint these molded fixtures can be given warm approval. They are strong, light and durable. As they are non-inflammable and self-insulating they more than satisfy any fire regulations dealing with equipment of their type. By like token, their insulating qualities eliminate the danger of a shock to persons sitting in bathtubs or contacting a radiator, who might touch a fixture. They are also acid, water and grease resisting.

The line is obtainable in specially developed compounds (Plaskon) ivory, green, black, white and orchid colors to permit jobbers a complete stock of fixtures without large inventory.

All these more or less technical considerations are very important to the people who make and provide electrical equipment to the elusive consumer. But they are not at all interesting to him. What then has caught his eye and opened his purse to procure them for himself? The secret rests in their answering the three qualifications listed in the second paragraph and in their permanent color beauty.



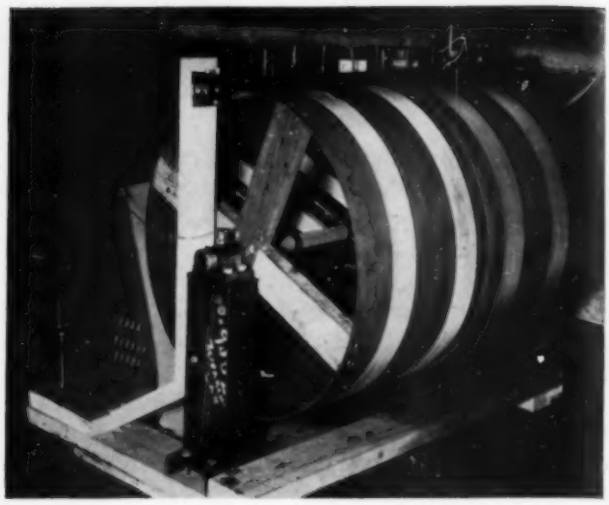
The molded fixture eliminates one of the most annoying characteristics of the metal one—the need for polishing, and the presence on walls and ceilings of stains resulting from such polishing. Because the Plaskon color is a part of the piece and not a finishing of some sort, it can never fade, craze or peel.

Back of the consumer's fancy for their color beauty stands the interior decorator who has welcomed the Pastel-Lite line with equal enthusiasm. Time was when it was an important point with designers to give much prominence to a ponderous overhanging chandelier. Today we find them equally concerned in subduing the electrical equipment. Throughout the home decorators favor the matched installation, possible in the molded color pastels. At the same time effective color combinations are available in the line for those who prefer different colors for different rooms.

The outstanding sales success that has been enjoyed by the pioneering Waterbury line argues well for plastic fixtures in the future. From a selling standpoint, their advantages and chiefly their color beauty have definitely clicked. It would be foolish to say that they may some day wholly displace the metal fixtures that are good today and will probably be good tomorrow. But that does not impair the fact that in this line of manufacture, the plastics industry has come upon a significant field—a field which should, properly developed, prove highly profitable.

Figure I

Testing drum on which strips of regular Fourdrinier wire are wound. Blocks of laminated plastics, wood, etc., are held against the revolving wire under constant pressure. Water is used to keep the surfaces wet during tests



Plastics in the paper industry

by H. J. Horne

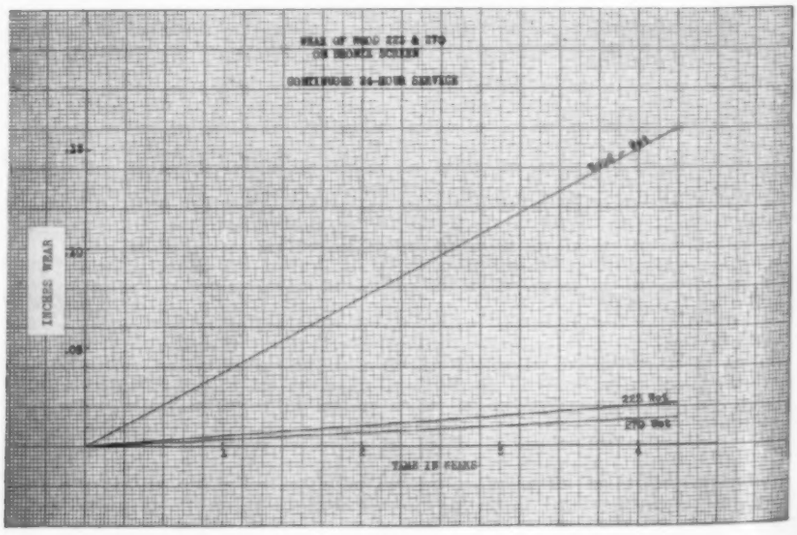
WESTINGHOUSE ELECTRIC & MANUFACTURING CO.

FROM time to time the Industrial World is aided by the conception and development of entirely new primary materials in the research laboratories. These new materials are always intriguing and attempts are frequently made to apply them to uses to which they are not suited. On the other hand, there are practically always applications into which these developments fit unusually well and give operating results far superior to those heretofore obtainable. This has been the experience of manufacturers of laminated plastic products. An excellent example of successful application is seen by the extensive use in the paper industry of plastic products.

It has been found that plastics can be manufactured which have a very low coefficient of friction against metals using water as a lubricating agent. Their use for bearings, suction box covers, toe blocks, etc., thus suggest them-

Figure II

Curves obtained in a six weeks' test indicating advantage of laminated plastics as against end grain maple



selves. A few of these most outstanding applications may be mentioned in more detail.

The first experiments with plastic suction box covers were carried out about four years ago using a high resin content duck filler with the laminations running parallel to the normal position of the Fourdrinier wire. These covers were only partially satisfactory for after the original resin surface film was worn through, an undesirable roughness developed. Experiments were then started to develop a cover having perpendicular laminations and thus present a uniform structure and density throughout the entire thickness of the board. The machine pictured in Figure I was built to test the rate of wear on a cover of this type compared with flat and

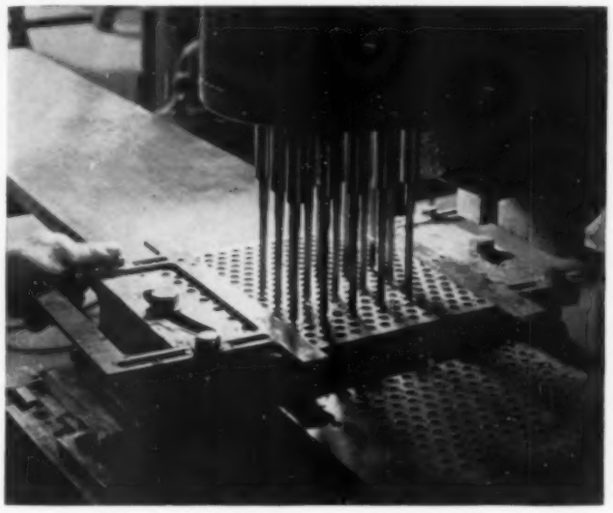


Figure III

Drilling plastic suction box cover

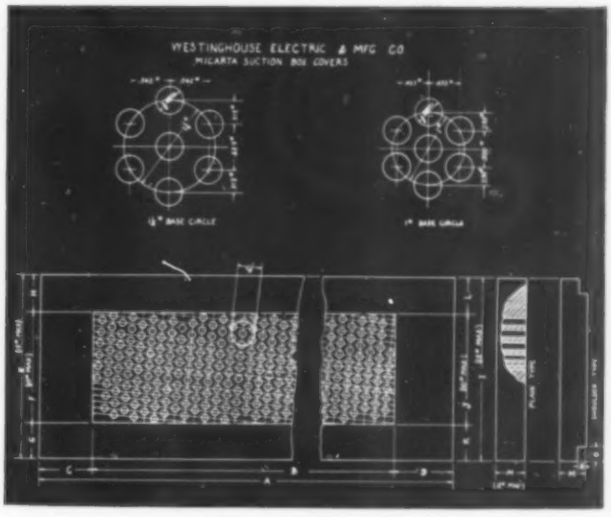


Figure IV

Standardized plan for multiple drilling

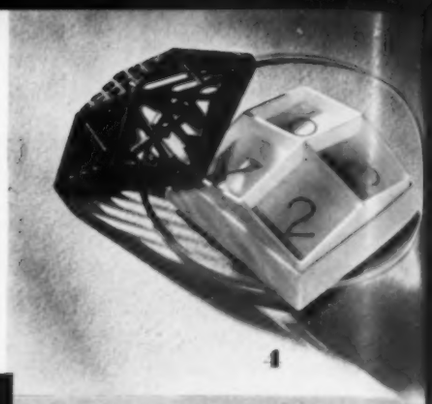
end grain maple covers. In an accelerated test of over six weeks, the curves shown in Figure II were obtained. This indicates a decided advantage in favor of the vertically laminated plastic suction box cover, and results of a large number of covers in actual operation bear out these conclusions.

A scientific study of various drilling patterns used in the industry was made with the idea of developing a plan which would equalize the suction on all points of the sheet. This has been accomplished to a degree far superior to any of the others investigated. Whereas some drilling patterns allowed a variation of as much as thirty per cent in suction from one point to another on the sheet, the maximum using the standardized Westinghouse drilling is less than three per cent. Several cases are on record especially from mills making colored stock, where streaking has been minimized by the use in this drilling design. This standardization also makes for lower cost in drilling as multiple spindle drills and fixtures are possible. Figure III shows a cover of this type being drilled in the factory.

Some of the advantages obtained on Fourdrinier operation using plastic suction box covers are (1) Much greater length of operation between resurfacing operations and consequent better average condition of the covers. (2) Lower power consumption due to decreased drag on the wire. In one complete installation on the West Coast, the saving alone amounts to over four dollars ($4.00) per day. (3) Elimination of streaking due to non-uniform suction. (4) Probable increase of useful life of the Fourdrinier wire. This last point is of course somewhat difficult to determine except over a somewhat extended length of time due to the many other variables involved. (5) Roughness and unevenness do not develop if the cover dries out thoroughly when not in use.

On cylinder machines the advantages are just as clearly proven. One mill in Ohio has by the use of plastic slice boards and suction box covers increased the average life of the six hundred dollar felt used on the machine from six or seven days to fourteen days. It is thus apparent that the laminated cover offers solutions to some of the problems every paper maker is up against, and the repeat orders which are obtained from operators are very encouraging.

Materials commonly used for doctor blades prior to the introduction of laminated materials had certain disadvantages. Some materials used were brittle and chipped. Others were hard and failed to clean the rolls properly without excessive pressure which usually caused the rolls to groove and wear down. Plastic does not have these disadvantages. It will not chip, crack, or warp. In addition, it is flexible, long-wearing, uniform and not chemically attacked by weak acids, alkalis, and pulp solutions. Instead of damaging the steel dryer or calendar rolls, a laminated blade puts a slight film on them which minimizes rusting during a shut-down. This (*Continued on page 56*)



developments of the month

1 Achieving growing usage in sales promotion and as premiums, are molded devices for viewing strip film sections. Simplest, least expensive yet seen, is the Harry Davies' picturscope, consisting of two identical halves which lock over film and lens. Film is moved, one section at a time, by action of fingers through small ovoid holes.

2 The Western Electric Company, producers of telephone equipment for the Bell System, have given us another indication of the value of redesign. They are now supplying to operating telephone companies the new No. 396 high efficiency transmitter for the use of operators in central offices (the new unit is illustrated in the left-hand side of the photograph). By redesigning the constituent parts of the old telephone transmitter and employing materials not used in the older model, they have produced a more comfortable and efficient device. Bakelite is used for the casing on the new instrument. Photo: Courtesy Bakelite Corp.

3 There's literally no end to the applications of plastics in replacing metals and other materials, as may be witnessed by the latest in tape measures. The case of this six-foot measure is produced in phenolic plastics by Associated Attleboro Manufacturers, Inc., and may be had in a variety of colors. No hand winding is necessary, because mechanism of the retracting spring functions on the window shade principle. Photo: Courtesy Bakelite Corp.

4 The Richmond Dental Manufacturing Company were concerned to find a sanitary and durable material when they were planning a new cotton pellet holder. Dentists want clean looking equipment easy to fill, handy to work with and hard to damage, and cotton holders are not excepted—in fact, they should be acid and fireproof as well. So Richmond pondered—then drew a winner that has almost doubled the sale of a previous, similar holder. Made of white Plaskon, the compact "Pyramid" (with black Durez top) has a separate compartment for the four standard-size pellets. It has every aforementioned characteristic that the dentist wanted it to have. It has even what he professes sometimes to care little about—good looks. Molded by the Norton Laboratories, Inc.

5 From England comes the very latest accessory for the comfort of smokers—a reproduction of a Half-Sherry bottle made entirely of black Bakelite. Especially molded for Teo-

fani & Company, Ltd., this "bottle" takes care of every requirement of the cigarette smoker . . . a compartment for cigarettes with independent lid, ash tray, and match container complete with striking surface. When not in use, the component parts fit snugly together as one unit in the form of a Sherry bottle. Teofani & Company, Ltd., employ this modern molded unit as a premium container for fifty Virginia cigarettes. Photo: Courtesy Bakelite Corporation.

6 A perpetual calendar which tells dates, months and even the day during any year from 1800 to the year 2000 A.D., is the latest in office equipment to be offered by the Ace Mfg. Co. Another unusual feature of the calendar is that the entire housing is molded in one piece of black Durez. The calendar is said to have special appeal to offices, libraries and teachers, for whom it simplifies the checking back of dates. Molded by American Record Corporation. Photo: Courtesy General Plastics, Inc.

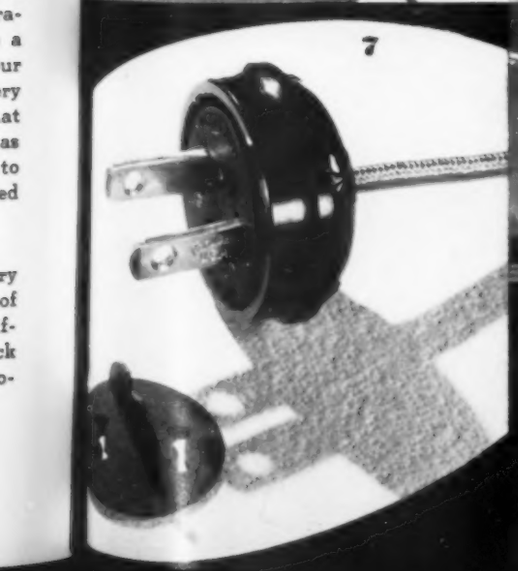
7 The Sepalator Co. has devised a means of preventing short circuits in attachment plugs. It has developed a new fibre separator with a fin running along the diameter of the fibre disk, which prevents wires from touching. It is a very simply constructed accessory, yet its value in preventing short circuits and consequent fires cannot be minimized.

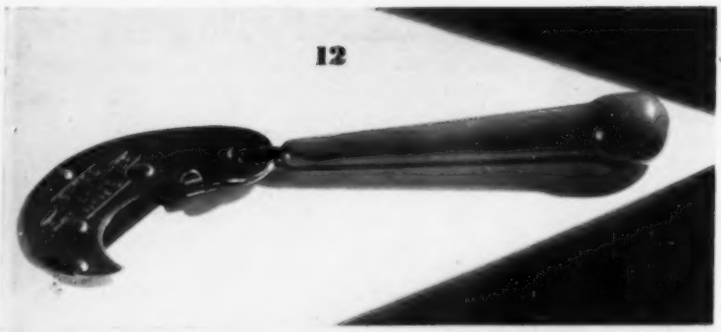
8 A new type of Lazy Susan dispenser for restaurant tables has recently been announced by Sudbury Brass Goods Mfg. Co. Applying ball bearing rotary action, the new dispensing tray is molded of Durez. It is molded in three pieces and has ample room for all the table accessories in its 13 inch diameter. Molded by Northern Industrial Chemical Co. Photo: General Plastics, Inc.

9 Western Union's newest installation at the Empire State Building in New York. Located in the observatory this booth is made of black Formica with chromium trimmings. The sign is inset into a hole in the front and is lighted from the rear. The baseboard is of black linoleum. Fabricated by Peter Vrankowitz & Co.

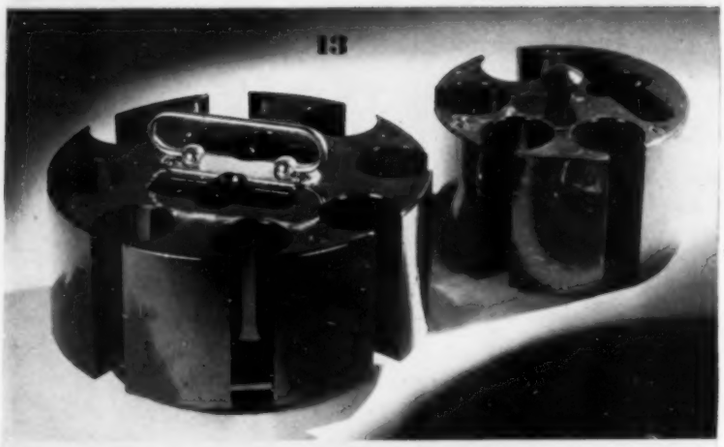
10 The Kelvinator Refrigerator has adopted a white Plaskon shade for its electric fixture which lights by opening the refrigerator door. Naturally, the shade had to be a translucent, white material which would stay white, clean easily and withstand rough treatment. Because it is molded color, the shade is likewise unaffected by the high humidity and extremes in temperature common to ice chests. And high dielectric strength (the ability to resist electric current) is a major reason for plastics popularity among electrical manufacturers. Notice, too, the combination of the plastic shade with the metal support—made possible by the moldability and tensile strength of the material. Molded by American Record Corporation.

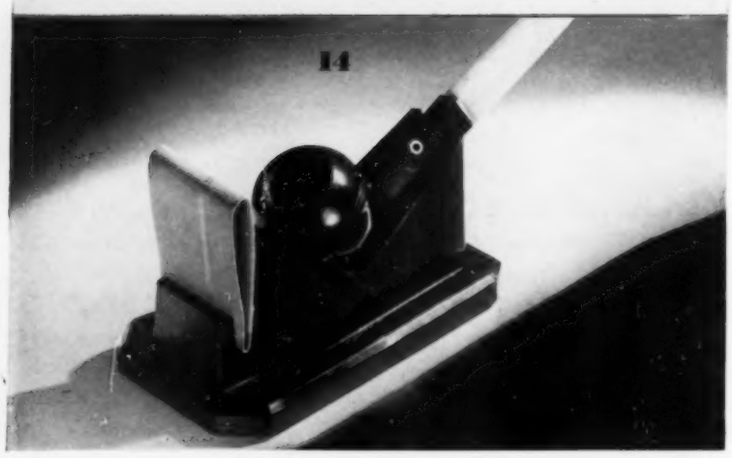
11 Since repeal, any number of ingenious measuring devices have been made of molded plastics. This one, the "Dual Jigger," is molded and marketed by the Harry Davies Company and measures ounces, jiggers and ponies. It consists of two conical molded sections threaded to lock together firmly. A wide range of color combinations is available.





12 This flower cutter is beautifully and sturdily made from rustproof stainless steel with handles of cardinal red or daffodil yellow Catalin. Neither hook nor handle can rust, peel or chip in any way. Each cutter is attractively packaged in a colorful individual box. The device is marketed by C. J. Bates & Son.





13 - 14 - 15 T. F. Butterfield, Inc., is making some novelties of plastics which were formerly made of wood or metal. These include whistles and racks for pipes and poker chips.

The racks used to be made of wood. Their design was changed somewhat and their appearance greatly improved due to the superiority of the plastic materials. The cost is about the same but a better article was produced. The compounds used are phenols and ureas, except a de luxe rack which is made of cellulose acetate.

The whistles were originally made of metal. The change to plastic material was because the metal would freeze to the lips in cold weather, whereas when made from plastics this condition is obviated. Some change in design was found to be desirable, to make them more adaptable for molding. That is, buffing operations were eliminated by changing the section where the ring that holds the chain is assembled to an octagonal shape. The same was done with the section where the cork is assembled. By having the mold meet on the edges of the octagon there was no visible mark left, but if the round cross-section were retained there would be a line which would have to be removed by buffing. The general appearance of the new whistle was also decidedly improved, without increase in cost. The same materials are used as for the racks.

"BETTER THAN GLASS" declare Western Union Engineers

MANY important applications of cast resin can be traced directly to the attempt of manufacturers or engineers to improve service from existing equipment.

Such a case is found in the lighting fixtures recently developed for the lobby of the Western Union Telegraph Building in New York City. This building is a model of modern architecture outside and within and exhibits several original engineering triumphs in the planning of its many floors. The lobby, however, beautiful as it is, demonstrated a deficiency in lighting which has recently been corrected. This high ceilinged corridor extends through the block square building for a distance of some two hundred feet, yet, its sole source of exterior light is in the small openings at either entrance. Its brick walls increased a tendency to be sombre.

For the original lighting, architects provided a series of troughs, hung high on the walls, casting light upward toward the ceilings. In theory, this indirect lighting was to have been reflected in a soft glow throughout the arcade. In practice, it proved inadequate and the mounting lighting bills served to indicate that the room was worthy of a better lighting arrangement. To overcome this condition, Western Union set its own engineers to designing a new lighting system. They substituted a series of floor standards with metal shades, which cast light both upward (for effect) and downward (for use). These produced a marked improvement in two respects. The arcade lost its gloominess and became a well-lighted building lobby, with a considerable saving in current consumption.

The information desk, near the center of the lobby, still remained too dark. Above it, jutting from the wall, is a huge two-faced electric clock—an extremely important fixture in this "on-the-minute" business of Western Union's, and one which, with the information desk, deserved better lighting equipment.

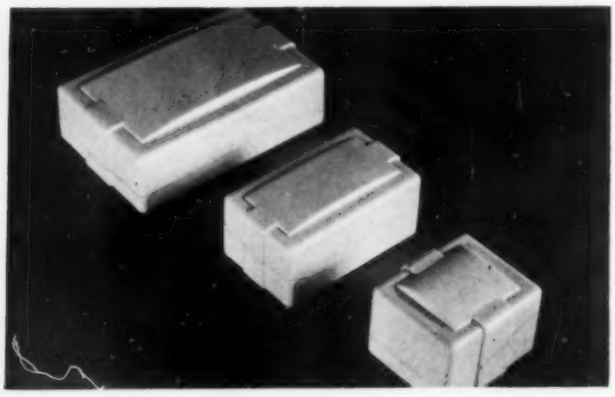
To remedy this condition, two counter lamps, similar in construction to those of the rest of the lobby, but on a smaller scale, were constructed. These direct-indirect fixtures have a scalloped metal shade, hiding the source of the light. A "Macbeth-Evans" glass reflector directed most of the light upward toward the clocks. The remaining light was intended to serve a double function. First, to illuminate the counter top itself. Second, to provide a point of light that might serve as a beacon to those who sought the information desk when they entered the building. To this end, the pedestals were buttressed with transparent amber Catalin, rising in tier formation from the metal base. In this manner, light reaching these strips from above enters principally through the horizontal facets of the cast-resin buttresses and creates a soft glow throughout the entire stand. (*Continued on page 63*)

Photographs Courtesy American Catalin Corp.

PLASKON

JEWELRY BOXES:

Since the first beauty nodded demure assent, faltering fingers have fumbled sparklers from plush-covered boxes. Shattering precedent, the Electric City Box Company has just made jewel cases in Plaskon—molded color. Modern in design and material, the boxes have been gratefully welcomed as a new, dramatic means to present fine jewels. The selection of Plaskon is significant tribute to its unmistakable color beauty. Molded by Rathbun of Jamestown, New York.



CLOSURES:

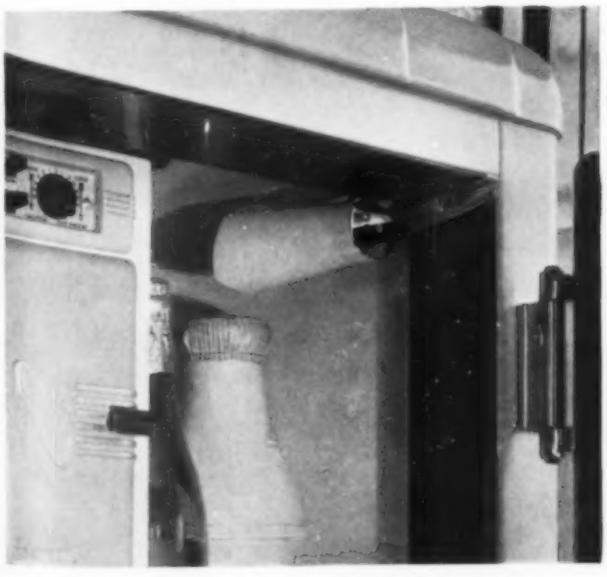
Plaskon's matchless color range is the acknowledged reason for its No. 1 popularity. But hardly the only reason. The unchanging high quality and uniform color of Plaskon give every material benefit to speedy production and spare costs. These Dorothy Gray closures, for instance, molded smoothly, threaded easily, and fitted tightly. Their strength reduced breakage in production and accelerated their shipment which was made at lower cost, because of their light weight. Now, all these are facts dearer to production bosses than to the ladies who noted their marine blue color, then stayed to purchase the contents they protect. Plaskon's point is that Plaskon—molded color—assures both parties equal, perfect satisfaction. Molded by Armstrong Cork Company in Lancaster, Pennsylvania.

MOLDED COLOR

JULY 1935

SHADE:

You are looking inside a Kelvinator refrigerator, and particularly at its interior lighting fixture. This ingenious gadget lights when the door opens, shuts off when it closes, and is altogether a big help in locating a midnight snack. Naturally, the shade had to be translucent, white material, able to be used readily with the metal bracket by which the fixture is held in place. What's more, it had to stay white, clean easily, and withstand occasional hard knocks. Permanent, white Plaskon which brought these qualifications—and the added advantage of high dielectric strength—was stationed at the cool post. And a more admirable sentry you have not seen. Molded by American Record Corporation in Scranton, Pennsylvania.

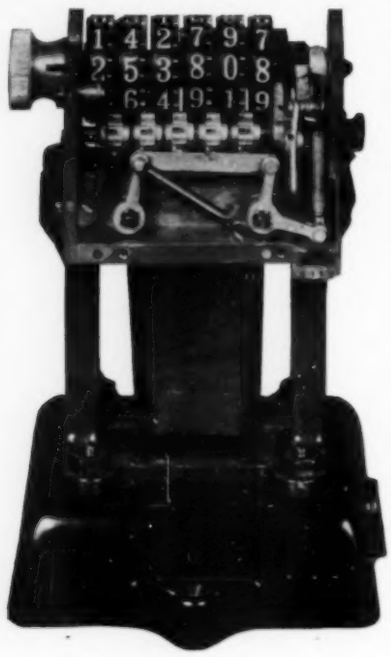


PREMIUM:

The Hills Bros. Coffee Guide helps prepare a better cup of coffee, eliminates the waste of tablespoon guesswork. But its advantage over ordinary measures rests chiefly in—its square shape, which is best for scooping all the coffee from a round coffee can; its high shock strength and permanent, brilliant red color; its time-saving "two-cup" size. For this good-will ambassador of their famous brand, Hills Bros. selected plastics. Plaskon, with its string of molded color premium winners, was a natural choice. The Remler Company in San Francisco is the molder.

TOLEDO
SYNTHETIC
PRODUCTS
INCORPORATED
TOLEDO - OHIO

49,000,000 IMPACTS!

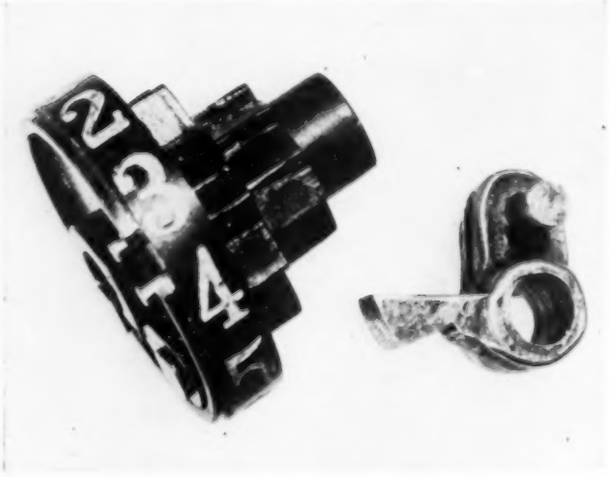


Plastic Counter-Wheels run continuously for over seventy days without showing wear. "Good for fifty million more impacts," say Production Instrument Company Engineers

IF you drove your car at sixty miles an hour continuously for over nine years, the fastest moving indicator on your speedometer would begin to approach the life record of the plastic counter-wheels shown here. You and your relief driver would quit long before that. Your car would crumble and give up in the first six months, at the utmost. Yet the speedometer would have to indicate almost five million miles before the little wheel that indicates tenths-of-a-mile would approach the punishment record of the wheels here shown.

The ability to withstand such punishment is not necessary for your speedometer. But high speed modern machinery requires mechanical and electrical counting mechanisms that will work at high speed for months at a stretch without loss of accuracy or breakdown. When Mr. Frank J. Cannon, of the Production Instrument Company praises plastics, therefore, be certain that his words are not uttered lightly. For it has been the problem of Mr. Cannon's company to keep up with and to anticipate the development of high-speed machinery, to the end that counting mechanisms of its manufacture could meet the forthcoming demand.

"In the manufacture of counting machines and recorders, in which our company has been engaged during the past twenty-three years," Mr. Cannon states, "we have found that the three very essential characteristics incorporated in the design of a good counting machine are: long life, accuracy and high speed. This last mentioned factor determined, to a degree, as all engineers (*Continued on page 49*)

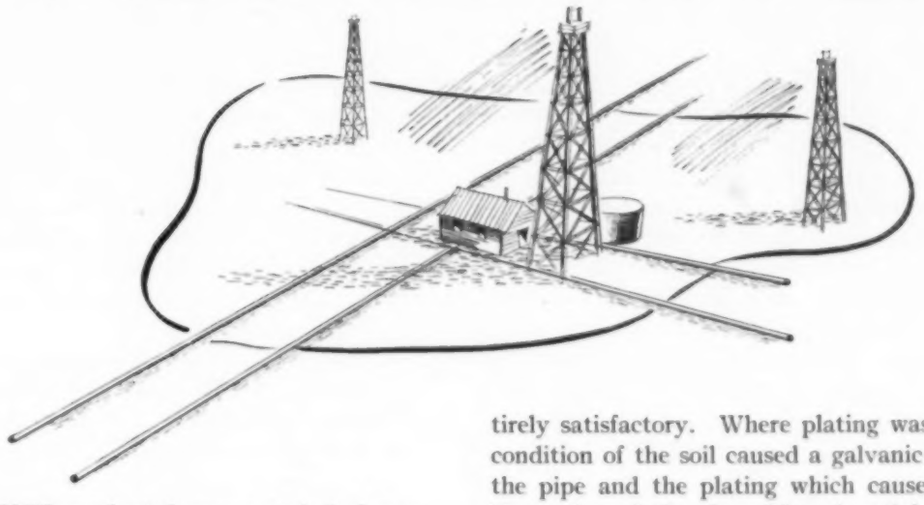


Wheel and pawl, from test electric counter, which have received 49,000,000 impulses at a speed of 516 per minute. Note excellent condition of plastic wheel after a test of this nature. Wheel is just as good as drop-forged pawl

Photographs, Courtesy of Bakelite Corp.

Another set from test counter. Pawl, of tobin bronze, would not stand the strain. Plastic wheel shows no appreciable wear. Chip off wheel-rachet was done accidentally in disassembling counter after run

CELLULOSE NITRATE PLASTICS for WRAPPING PIPE LINES



EXPERIMENTS conducted over a period of more than three years in the Texas oil fields by a major pipe line company indicate that the expensive and troublesome corrosion evil, which pipe lines have been unsuccessfully combating for years, has been virtually solved by wrapping the pipes with a cellulose nitrate plastic, one of the trade names of which is Pyralin, a product of the DuPont Viscoloid Company. The experiments that have been completed with this product, and those which are still in progress, have given such satisfactory results that officials of the pipe line company believe a solution of the problem has been found.

For years pipe line companies have used several different types of covering in their search for a corrosion-proof material, but have had little success. The most economical and practical covering used before the advent of cellulose nitrate plastics in the pipe line covering field was an asphalt coating wrapped with tar paper. The asphalt was heated and applied to the pipes in liquid form, being poured on and allowed to solidify. Usually, there were two coats of about $^1/_4$ inch in thickness. The outside wrapping was of felt, around which tar paper was wrapped. Four field operations were required in the covering of the pipe and the method of application was very cumbersome.

If the pipe was placed too near the surface of the ground, after being coated, there was a tendency for the asphalt to soften and flow due to the action of the sun's heat. During rainy weather, water seeped through the tar paper coating and the felt would rot, thus destroying the effectiveness of the coating. In dry weather, where there is a large earth contraction, the rough coating which was inherent with this type of covering material, would be torn away from the pipe by the contraction of the ground. Surface or ground water would then be free to act upon the pipe as though no original covering had been placed on it.

Other corrosion-preventing covers that have been used are rubber, aluminum paint, tin foil, nickel and chrome plating and enamel. None of these proved entirely satisfactory. Where plating was used, the acid condition of the soil caused a galvanic action between the pipe and the plating which caused a separation. Enameling of the pipe although satisfactory in theory because it would present a smooth surface which would permit the earth to slip along the pipe without causing a break, did not prove practical as the enamel coating would never remain entirely free from minute pin holes which permitted the entrance of moisture. In addition, the enamel coating was not sufficiently flexible to permit the pipe to be bent without causing a cracking of the enamel. The corrosion-resisting qualities of the pipe proved negligible once the surface had been cracked to the extent that moisture would enter the pipe line proper.

In consequence of their previous unsatisfactory experiences, the pipe line company began experimenting with cellulose nitrate plastics more than three years ago. The first experiments were made on spindle tops and the results obtained there were so promising that sections of pipes were tried in localities where previous coatings had proved unsatisfactory. These tests have been distinctly promising because of the additional active life possible with a cellulose nitrate plastic coating and the distinct ease of application of the plastic to the pipe, which makes a solid flexible tube that, for all practical purposes, is both air-tight and water-proof. It is not appreciably affected when exposed to damp atmospheres or immersed in water and, under favorable conditions, will take up approximately 3 per cent of its weight in water, but it has been shown in actual practice that, although the cellulose nitrate plastic covered pipe was laid through a swamp containing free alkali in the water, there was no appreciable corrosion of the pipe. It is, consequently, considered equivalent to being water-proof for pipe covering.

The pipe line company is now covering about 300 miles of pipe line for experiments, and other pipe line companies are said to be keenly interested in the results. These experiments have shown that cellulose nitrate plastic remains smooth and hard, with the result that the earth surrounding the pipes when contracting slips away leaving the wrap- (*Continued on page 46*)

IS THE PREMIUM FIELD A PLASTICS FIELD?

by Howard W. Dunk

THE growth of the National Premium Exposition, held late this May in Chicago, serves to emphasize the fact that premium advertising and selling is becoming more firmly entrenched and widely used than ever before in this country. Both the character of the exhibitors—which included such important plastic producing and using factors as The Celluloid Corporation, the American Cyanamid Corp. (Beetleware Division), the Aluminum Goods Mfg. Co., The Bakelite Corp., the Harry Davies Company, the Hazel-Atlas Glass Company, the Manning-Bowman Co., the Oneida Community, Ltd., and the Owens-Illinois Glass Company—as well as the type of buyer represented at the exhibit served to point the growing possibilities and changing trends in this field.

Particularly noteworthy among visiting firms were such outstanding long-time premium users as General Foods, Colgate, Nestle's Milk Products, Inc., Swift and Co., and Grand Union Tea Co. Equally noteworthy was the presence of a number of advertising agency representatives, particularly those from agencies sponsoring radio campaigns involving the use of premiums.

In all, some hundred and twenty-eight firms were included among the exhibitors, showing their wares to several thousand prospective premium users.

What then can the premium-wise merchandiser say of plastic achievements and plastic possibilities in this field? Plastics are particularly suited as the basic material for production of premiums for many purposes. In the first place, the very nature of the product lends to development of from either special or stock molds of a completely ramified line with a strong premium appeal. Its weight being light, makes it extremely helpful to the premium user inasmuch as in the average case weight is a definite consideration from the shipping standpoint, whether the premium be included with the product (as a separate item in the carton of the product itself), whether it be made a re-use premium, i.e., a package container, or whether it may be shipped separately by drop shipment, parcel post, express, etc. Plastic material overcomes practically all of these difficulties and further lends itself to one great advantage from the premium standpoint—*individuality* can be *created* and *maintained*.

Consider, step by step, the various functions a premium can be called upon to perform, and you will obtain a better picture of the position of plastics in this field. The reasons for premium use are, concisely:

1. To introduce new products.

   Example. The Gold Dust Corp. introducing Silver Dust.

2. To introduce products into new territories.

   Example. Thomas J. Lipton Co. introducing green tea with a *plastic* tea strainer (as a very successful premium).

3. Increasing the unit of sales.

   Example. Stanco, Inc., maker of Flit in offering a big moth bag free with every *quart* of Flit.
   A dental preparation manufacturer offering a pencil to sell *three packages* of dental cream instead of one at one time.
   Proctor & Gamble's use of premiums with Crisco to push the sale of the *3-lb. can*.

4. To help consumers use the proper product correctly.

   Example. Brown & Williamson Tobacco Corporation's offer of a (*Continued on page 59*)

Plastics Invades Building Hardware Field

IT is a curious fact that those applications of plastics which seem most natural and logical, from a standpoint of utility and lowered cost, are often postponed and delayed by other considerations while seemingly more difficult fields fall before the plastic onslaught. In some cases, the failure of a single ill-advised design has retarded plastic adaptation throughout an entire field. In others, the inbred conservatism of engineering or merchandising staffs has prevented the introduction of plastics just as it has blocked a thousand and one other logical changes.

In the hardware field, however, another condition has long existed as a retarding factor. The makers of locksets, door-knobs, and similar domestic and commercial hardware are a limited group with large investments in metal working equipment, metal stocks, dies, and tools. Their working staffs are, in large part, composed of men whose highly developed skill is in the metal working field. Finally, the major organizations in the field are, for the most part, closely allied to the great New England metal refining and metal working interests.

Hence every factor requisite for an extremely conservative attitude in regard to newer materials exists in this particular field. Whereas the successful development of a plastic part or unit in most other fields would tend toward increasing profits with increasing sales; in this particular industry too great a success for plastic units might upset the apple cart entirely—throwing out of employment much metal-working equipment, delaying the absorption of metal inventories and otherwise dislocating things in a thoroughly expensive manner. A real danger exists that profits on plastics would be wiped out by the write-off necessarily involved in the change-over.

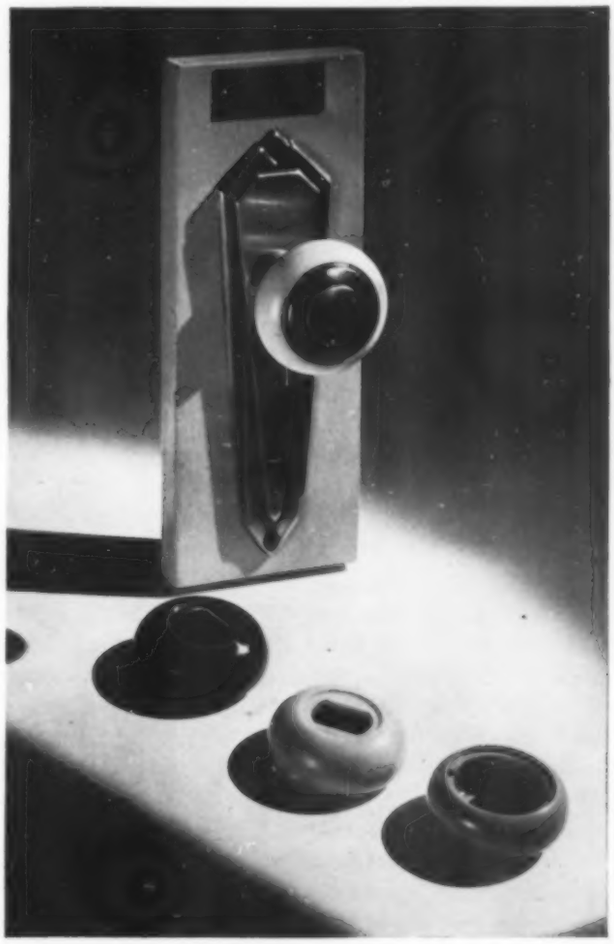
It may be asked—and with good reason—why other interests don't enter this field; interests unburdened with foundries and plants useful only for metal fabrication. The answer, here, is that others have entered the field . . . but to only a limited extent. For successful merchandising in the hardware and builders' supply fields involves the setting up of a complete apparatus for selling literally thousands of dealers—an apparatus which the established metal working companies have acquired over a long period of years and one which would involve tremendous investments on the part of any new firm seeking volume business.

Nonetheless, slowly, haltingly, the hardware industry is beginning to turn to plastics. The process has been further delayed by the almost complete stagnation of the building industry, but it begins to make itself apparent.

What may prove to be a major turn in the direction of plastic usage is the introduction of a new type of lockset by the Lockwood Hardware Manufacturing Company, a division of the Independent Lock Company. This firm, influenced by the current trend toward more colorful interior finishes and by the depression-bred desire of dealers to maintain low stocks, has found the solution to both problems in a combination of metal and plastics to form what it terms its *Lockwood Patrician* line. Here a molded plastic knob body is held to a die-cast shank by a die-cast metal top-plate. The knob construction is such that the molded body is securely held to the top and shank by means of integral lugs, so that there can be no twisting such as sometimes occurs with the old-fashioned glass knobs.

By means of this construction, dual advantages are gained, both for the ultimate user and for the dealer who makes the sale. The user gains greatly widened color choice while the dealer can provide this without maintaining an unwieldy and expensive stock.

Attempts at securing color variety in all-metal fittings have always been stumped by the difficulties of permanently applying a finish to a part so subject to hard knocks and rough handling. Since enameling or japanning quickly chipped and exposed the raw metal beneath, hardware manufacturers have—until now—made a virtue of necessity and restricted themselves largely to the natural colors of brass, bronze, nickel, and chromium. In contrast, Lock- (*Continued on page 37*)



EDITORIAL OPINION

TWO separate and distinct opportunities will be offered manufacturers of plastic products and plastic materials this Fall to demonstrate the true worth of their merchandise as essential ingredients in the march of industrial progress. Both opportunities, embracing diversified fields, are equally grand.

The first will be the National Exposition of Architecture, Decorative and Industrial Arts which will be sponsored by the Architectural League of New York in Grand Central Palace, N. Y. C., from October 10 to 19, inclusive. This exposition, the fifth of its kind to be held in this city, is being planned with the cooperation of the officers of the league, the American Institute of Architects, and the American Institute of Decorators under the chairmanship of Harvey Wiley Corbett. Small homes and country houses will receive greater attention than in previous years according to the announcement, because of increased interest in this branch of construction and the stimulus given to it by the Federal housing program.

The second opportunity lies in the announced exhibition of Art in American Life and Industry which will hold forth in Commerce Hall, Port of Authority Commerce Building, New York City, from November 25 to December 14, with an avowed purpose of making large groups of appreciative visitors art conscious. This exhibition is planned to show the public in many different ways what art has done to make the life of every American, rich or poor, a preeminently pleasant daily experience. The exhibits, according to the announcement, will range from grouped displays of finely designed articles of everyday use and functionally beautiful industrial machines for transportation and manufacture to great masterpieces of painting and sculpture. It will point out clearly and dramatically what the American artist independently or in the employ of industry is doing for the public, in the home, at work, and at play.

The industrial and commercial division will be exceedingly inclusive in its range of materials and it would seem that this is the right time for those most interested in the promotion and furtherance of plastics and things made from plastics to demonstrate the worth of their individual products in this field of comparison. Probably no other industrial material has ever engaged the interest and attention that has been accorded to thermo setting plastics and cast resins during the past few years, and for this reason manufacturers engaged in their development and conversion should be alert to the opportunities offered by these exhibitions to acquaint the public with the tremendous progress that has been made.

Displays of familiar objects in which plastics have been used are undoubtedly interesting and beneficial to a limited extent. The public is thus informed that this new material it has come to accept and approve is a substance of known properties. That it has qualities which particularly fit it to definite uses where it is superior to other materials formerly used for the purpose. It may even be shown in pleasing comparison with materials it has replaced. But are such displays *adequate?* Isn't it possible to dramatize the replacement by plastics of less useful and less decorative materials in a simple manner that will leave a permanent impression in the minds of those who witness such demonstrations that no other material is equal or comparable for the definite purpose chosen to illustrate?

A thirty-second demonstration of a blow torch, for instance, directed against a sheet of laminated plastic will convince the most skeptic person that it doesn't burn like wood. That it is, therefore, a preferable material to use in all manner of construction work where fire hazards are present or possible. Once convinced, such persons will begin to demand its use, and soon will be satisfied with no substitute material. What better proof can a manufacturer offer to back up claims that his material is alcohol-proof than to dramatize it at such exhibitions by dipping an object in alcohol and wiping it dry before the amazed eyes of those who see it.

Placing a lighted cigarette on an ash tray of plastics is unconvincing—ash trays are not supposed to burn. But place a lighted cigarette (or spill alcohol) on a beautiful tea tray or table top of inlaid laminated and hear the gasp of horror escape the lips of a feminine audience. Watch their surprise when they learn no damage has been done.

Homely examples to be sure, but more convincing than thousands of words. It would seem that these exhibitions present illimitable opportunity to demonstrate the intrinsic value of plastics as fundamental materials. Not alone in their present accomplishment, but through projected imagination into the future. Model homes, ships, trains, and planes, each with its proper application of plastics clearly defined could be shown along with other industrial products of the present and future in a manner so convincing as to leave no doubt in the minds of the architect, the engineer, the industrialist, the merchant, or the public, as to the proper and important place plastics hold in the march of progress today, nor of what may be expected from their challenge tomorrow.

PLASTICS PROVES SUPERIOR TO METAL

IT is but a short time since molded plastics were thought too brittle and fragile for use in industrial applications which involved excessive vibration and hard and repeated usage. Yet today, an ever increasing number of industrial tools testifies to the usefulness and practicability of molding for such purposes—testifies, in fact, to the superiority of molding over other methods and of plastics over other materials for many of these applications.

An outstanding example is found in the new Skilsaw ball-bearing hand grinder, a lightweight, high speed utility grinding tool designed for use in industrial plants, foundries and die-shops. Here a two-piece phenolic molding provides housing, bearing, grip and motor-ventilator, all in one. In spite of the hazards of foundry "life," in spite of the extra hazards imposed upon tools suspended on overhead springs or trolleys, in spite of a free speed of 18,000 R.P.M.—these moldings have provided an excellent record of service and durability. Yet,

though their wear and shock resisting qualities are fully up to any demands that may be imposed upon them, these molded housings provide still other advantages which could not be offered by metals. Prime among these is the cool comfortable grip which the low heat conductivity of phenolic plastics permits. Since specially designed louvres in the housing permit adequate, motor-cooling ventilation (while preventing the entrance of dust or dirt into the motor itself), the low heat conductivity of the molded case, in comparison with that of the metal case, has no effect on the motor itself. On the contrary, the housing remains cool, under all conditions of use.

Ribbed hand grips, molded into the lower, handle-like portion of the housing, permit one hand control of the tool, leaving the other hand free to hold the work or guide the tool as desired. The long molded stem, between motor and chuck, permits of entrance of the grinder into deep corners and into the interior of hollow vessels, etc. Of particular importance, in this as in many other instances, is the fact that the molded housing reduces the dangers of outdoor usage of electrical tools. Water damage and the accompanying shorts are largely eliminated when phenolic plastics are substituted for metals, while lower costs are achieved due to the elimination of much interior insulation and to the ease with which bushings, etc., are incorporated into the piece during the single-molding operation.

Credit: To Chicago Molded Products Corp. for molding.

PLASTICS IN BUILDING HARDWARE FIELD

(*Continued from page 35*) wood now offers Ebony(in a phenol resin) and Ivory, Green, Orchid, Mahogany, and Chinese Red (in Plaskon) . . . colors which may be further varied by their combination with brass or nickel bronze or chromium. Since color change involves no added expense for molds or in molding, further variations will depend solely upon the development of new trends and new demands for other colors and shades.

Yet, in spite of this wide color range—twenty-four combinations are possible within the present limitations of the line—the dealer need stock only sufficient complete locksets to meet his normal demand. In addition, he stocks an assortment of molded sections which can be held as low as a dozen pairs of each color in the case of small dealers . . . involving an investment of only fifteen dollars. When a customer requires a green knob, for the inside of a bath or kitchen, the dealer merely removes that standard black unit from the shank and replaces it with a green one. Upon re-ordering, the dealer adjusts his stock to meet the particular color tendencies of his community. Thus the plastic-metal knob construction eliminates the substantial investment that would otherwise be necessary for a full range of color choice.

Further possibilities for variation of choice are involved in the development, by the Lockwood Company, of slightly more expensive shanks and solid cast escutcheon plates in French or Colonial design, planned for use in the highest grade of residence work. Similarly, there are five different designs of die-cast tops, which can be taken by the dealer from his stock assortment to meet the most exacting and varied tastes. A wide range of escutcheon designs are also available.

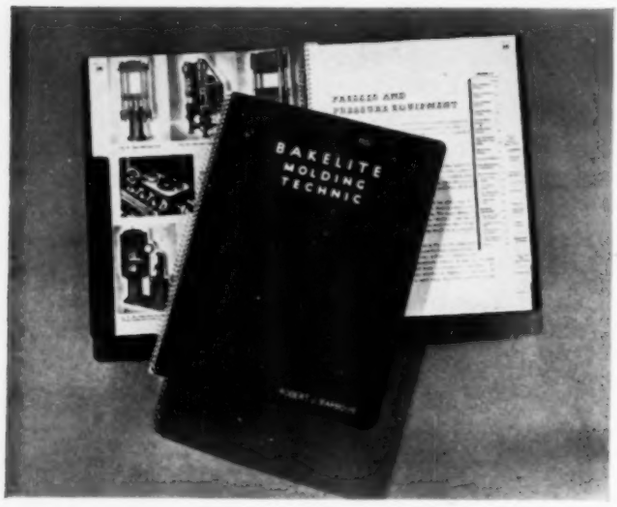
Early sales returns are reported to be unusually encouraging. The molded construction permits of modest pricing and orders, from territories where the first knobs were displayed, have been large enough to warrant the companies urging its dealers to anticipate their needs to the fullest possible extent to avoid a possible shortage at the production end.

Having made the first and most difficult step, the Lockwood Company is now in a position to follow up its advantage, with additional designs involving only low cost changes, for the combination type of construction permits alteration of appearance by changing only a single one of the elements; thus, a variation of the knob shape by the introduction of fluting or of octagonal or other shape to the molded handle, would involve only a change of molds, calling for no alteration in the fabrication of the die cast shank and top. And a careful planning for interchangeability, will result in geometrical growth of the number of appearance variations possible without prohibitively costly stock expansion.

LITERATURE

Bakelite Molding Technic

In commemoration of the twenty-fifth anniversary of its formation, the Bakelite Corporation has issued a special edition of this volume, undoubtedly one of the most complete and detailed handbooks of molding practice ever compiled. Its thirteen chapters detail a vast amount of information vital to the molder, including such headings as "Principles of Molding," "Molds," "Materials," "Presses and Pressure Equipment," "Inspection of Finished Products," and "Plant Layout." Eighty-nine photographs, drawings, diagrams and graphs illustrate the 120 pages.



Of particular interest is the manner in which this special edition has been bound. The covers are of gleaming black Bakelite laminated stock on the surfaces with a white layer between the black panels. These boards are riveted to thin metal strips which are perforated to accept the spiral binding. The title has been sand-blasted into the surface of the panel, so that permanent white lettering stands out in relief.

While written to meet the needs of the molding technician and the practical working molder, users and specifiers of molding will find much that is of great clarifying value within the pages of Molding Technic. The section on "Fundamentals of Mold Design" and that entitled "Do's and Don'ts of Mold Design" give a most detailed and lucid explanation of the methods which, when followed, produce the least expensive and most practical results. The lay reader will likewise get much information from the section entitled "Definitions of Terms," in which the everyday language of the molder and molding engineer is translated into more usual terms.

Yet, it must be made clear, Molding Technic is written essentially for the use of custom and trade molders ... the men who design, develop and produce the millions of molded parts, each with their special problems. For them it provides an up-to-date source of accurate, technical information ... a means of checking instantly on any practice, of learning instantly what to do toward meeting a given situation. Much of the information given will seem, at first glance, elementary to the experienced molder. Yet, it is exceedingly important that all facts ... elementary and otherwise ... be available in a single, easily delved-into source. Such a source is Bakelite Molding Technic.

Time Control Unit

Automatic Temperature Control Co. has issued a new catalog describing the new Series 1274-5-6—Time Controls designed to repeat one or two operations or processes as often as desired. Provision has been made for exceedingly flexible choice of periods during which the controlled actions take place. The time controls in this series will handle a repetitive action or operation requiring a definite time period or cycle with either the same or different time period between successive time cycles. The time cycle and also the interval between successive cycles is infinitely adjustable with an accuracy of setting to within a split scale division of the respective dial ranges selected. Parts have been so grouped on chassis that adjustment is simple. Jack connections permit removal of parts without disturbing wiring. Settings remain accurate despite vibration. Special contact-metal transmits current even when oxidized.

Cable Accessories Book

As a companion book to GEA-1731, "How to Make Cable Joints," issued last year, the General Electric Company now has available a new publication, GEA-1839, "Cable Accessories." The two books should be of interest and assistance to everyone who is engaged in work that involves the jointing and terminating of insulated cable.

"How to Make Cable Joints" gives clear and concise instructions for splicing, jointing and terminating all types of insulated cable. Its forty-four pages are illustrated with drawings and construction men can easily follow the instructions while on the job.

"Cable Accessories" lists and describes all the materials required for this work—joints, connectors, terminals, reservoirs and other materials. It has eighty pages and is complete in every respect—including prices. It should prove useful in making up jointing standards and as a general reference book.

Copies of these publications can be obtained from the nearest General Electric sales office or from General Electric Company, Dept. 6N-201, Schenectady, New York.

TENITE MOLDINGS *by*

AMERICAN INSULATOR CORPORATION

•

AMERICAN RECORD CORPORATION

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Thirteen leading motor cars now use

TENITE

••• in their interior appointments, because of its beautiful color effects, its freedom from breakage, and the secure anchorage it provides for metal parts. The unsurpassed strength and unlimited color range of Tenite make it the ideal plastic for many other industrial and decorative uses. Send today for an illustrated booklet and samples of Tenite.

TENNESSEE EASTMAN CORPORATION *(Subsidiary of Eastman Kodak Co.),* **KINGSPORT, TENN.**

New ideas

● Wall panels and like building material, of wood covered with a synthetic resin, can be successfully made by applying a layer of resin to the wood and hot-pressing between polished steel plates under pressures ranging up to 25 atm. Particularly fine finish effects are obtained in this way. (K. R. van Staal, Dutch Patent Application 63,550.)

● Highly porous shaped articles for filtering and clarifying liquids are molded from a polymerized or heat-polymerizable resin, such as a coumarone resin or an acrolein polymer, or from synthetic rubber or from a cellulose solution or derivative such as viscose. Porosity, which may range from coarse to extremely fine as required, is imparted to the product by means of a granular filler, organic or inorganic, comminuted to a particle size which depends on the desired porosity. The composition is molded to shape, and hardened or coagulated as required; the filler is then leached out, leaving a porous shaped article which serves excellently as a filter medium. Special properties such as high resistance to acids or oils or the like can be obtained by adapting the synthetic resin or cellulose derivative composition to the desired property. (Nicolai P. Stepitchev, French Patent 764,616.)

● Photoelectric cells, with their rapidly growing range of uses, afford a number of opportunities for the use of plastics. Among the latest, designed for photoelectric cells of the selenium type, is a support for the photosensitive layer. This support is made up from a firmly bonded laminated block of alternate layers of a conductor (metal foil) and a non-conductor (Phenolic resin); transverse slices from the block are coated with the selenium material. (Constantin Chilowsky, French Patent 43,016/747,791.)

● Tubing for feed lines in automobiles, aircraft and the like, and even in stationary machines when vibration is severe, is frequently unsatisfactory from the standpoint of service life. A flexible, acidproof, waterproof, oilproof tube with remarkable durability under severe service conditions is made from polyvinyl alcohol (with or without fillers, softeners, etc.) by tubing the plastic material in a tubing machine. The tubes thus made are absolutely smooth on the inside. (Ernst Schnabel, French Patent 764,732.)

● Building blocks which are very light and are also fireproof are made from Phenolic resin or a like material by molding under conditions which impart high porosity, preferably using the pressure release method of blowing. In this method an inert gas is dissolved or dispersed in the plastic material under pressure, and fine bubbles are formed by releasing the pressure. The porous plastic material is molded and hardened in blocks, bricks or slabs for building purposes. (Camille L. E. Burel, French Patent 765,547.)

● A new and improved design for a cigaret lighter encountered difficulties because the molded cover suffered heat damage from the flame of the lighter. The molder solved the problem, without changing the design, by applying a thin layer of metal, which dissipated the heat sufficiently by radiation so that it was not even necessary to employ a less heat-sensitive plastic (which would have been more expensive) in the molding. Probably other instances of heat exposure in molded plastics could be benefited by the same expedient. (*Kunststoffe*, May, p. 127.)

● Low specific gravity, much praised as a major advantage of plastic materials over metals, sometimes becomes a disadvantage; in vases, table lamps, desk clocks and other articles having a molded base and designed to stand on a flat surface, topheaviness due to the lightness of the base may be a source of difficulty; thus, a vase which stands well when empty may be quite unable to stand upright when filled with flowers. Weighting the hollow base to lower the center of gravity in such articles is such a simple precaution that it seems strange it was ever neglected by designers and molders; yet even today instances of such neglect may be seen and complaints about the consequences may be heard. (*Kunststoffe*, May, p. 127.)

● Containers for automotive storage batteries are made in two layers, integrally joined by heat. The outer layer may be made of any inexpensive plastic material with the requisite molding properties; the inner layer is especially compounded to withstand the action of the electrolyte, and is made of Phenolic resin, or a resin of the polymerized hydrocarbon type, or a cellulose derivative. (Société des Accumulateurs Electriques, ancien. Établissements Alfred Dinin; French Patent 771,652.)

● A sheet material for refining transformer oil, paraffin, waxes or the like is made of a fibrous or porous material, e.g., a porous Phenolic resin slab of suitable thickness, and is operated in an electric field so that impurities are removed which would escape ordinary filtration. (Imperial Japanese Ministry of Commerce, British Patent 419,292.)

● Thermal and acoustic insulation is made of polymerized styrene, vinyl chloride, vinyl esters, or mixtures of these with each other or with polymerized acrylic acid esters. The heat and sound insulating efficacy of these shaped plastics (in blocks, slabs, or other forms as required) is imparted to the material by any suitable method for rendering the composition porous during the molding operation. (Dynamit-Aktiengesellschaft vormals Alfred Nobel et Cie., French Patent 774,401.)

● In making molding compositions it is sometimes desirable to use alkaline fillers, which are too sensitive to acids for use in the usual synthetic resins. A new resin in which such fillers can be used without any deleterious effect is of the glyptal type; it may be made, for example, from adipic acid and glycerol, with ethyl or butyl alcohol to take up the final acidity by esterification following the condensation. The new resin is especially useful for products made wholly or partly of paper impregnated with the resin and filler composition. (Degea Aktiengesellschaft (Auergesellschaft), German Patent 609,243.)

● Among the most modern applicators for underarm deodorants is a molded perforated sprinkler top for bottles of liquid deodorant; being inert to aluminum chloride, this applicator is especially useful for those deodorants which are composed of aqueous aluminum chloride solution. (Société Anonyme Substantia, French Patent 767,144.)

Over 70 years experience in the design, engineering and molding of plastics has qualified the organization to tackle and solve any job—and to save you time, trouble and expense in doing so. Let us help you with your planning and designing.

THE WATERBURY BUTTON CO.

ESTABLISHED 1812
Plastic Division
WATERBURY, CONN.

Molders of Bakelite—Durez—Beetle—Unyte—Plaskon—Tenite—Shellac.

NEW MACHINERY

New Alnor Pyrometer Gives "Multi-Point" Readings

A new pyrometer has been announced by the Illinois Testing Laboratories which makes possible the control of temperatures at a number of points in a plastic molding or laminating plant from a single, central location. Such an instrument should prove of particular interest to plastic laminators, both for control of heat at various stages in the primary, resin-treatment process and for control of the individual pikes within a laminating press. In molding plants, where a single operator works two or more presses or where it is desired to permit a foreman or supervisor to observe the degree of control on a series of presses, this instrument should likewise be found a great advance over previously available heat recording instruments.

The Alnor Horizontal Edgewise Pyrometer consists of a single indicator set above a switching apparatus which permits instant readings of thermocouples located at any desired point in the plant. Selector switches are provided, having eight circuits and one "off" position, 17 circuits and one "off" position, 18 circuits with or without an additional "off" position and 25 circuits with an "off" position. Pyrometers can also be supplied for as many as forty-eight circuits.

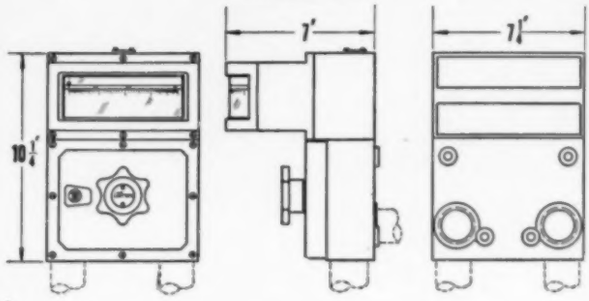
The pyrometer indicator is rigidly constructed to withstand vibration, jars or shocks and may, therefore, be mounted either on a wall or control panel or directly over a press or machine. The scale is six inches long and provides readings from zero to one thousand degrees. Alternate indicators can be had reading up to 3000 degrees. Both indicator and switch are enclosed in a specially designed, water-proof case which excludes moisture, fumes and dust.

Each installation requires one thermocouple for each zone of which a temperature reading is required. These are connected to the switch by duplex copper or duplex alloy wires supplied by the manufacturer.

The switch is of the double pole, rotary selector type, assembled in a water-tight aluminum housing, around which are the binding posts for the thermocouple wires. This housing is further enclosed in a roomy outer case.

The plus or positive binding posts for each thermocouple are directly above the negative binding post. The end of each wire is rigidly held by the special type binding post. These features permit wiring this switch in far less time than other makes

DIMENSION LAYOUT FOR EDGEWISE MULTI POINT PYROMETER



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P-2127

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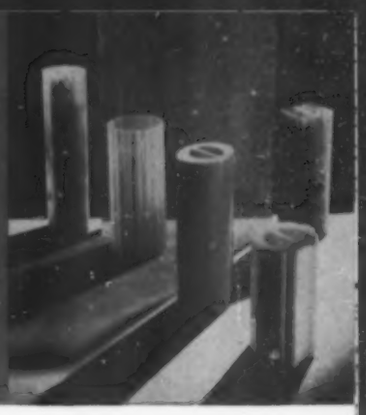

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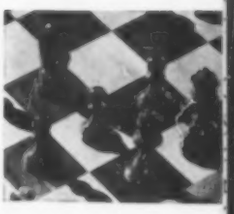

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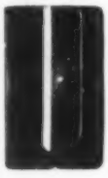

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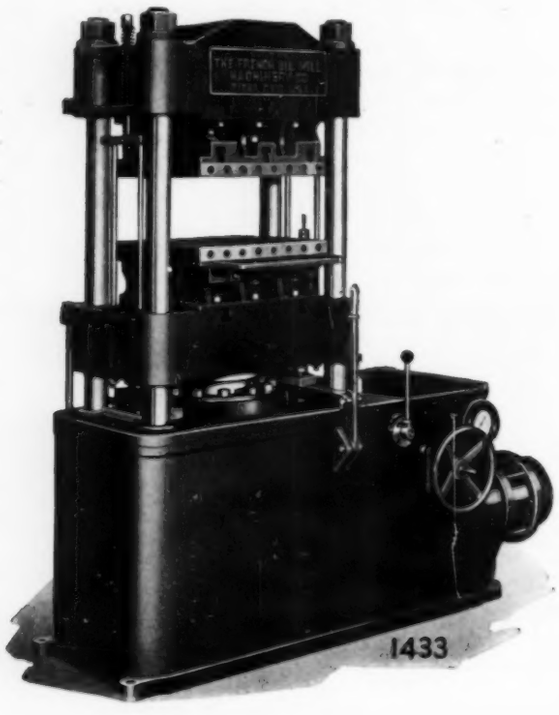
Both the main switch cover and the observation window are water-tight, as is the entrance point of the switch knob. The switch case is furnished with openings for either back or front wiring connections as desired. A dial, rotating with the switch arm, indicates the particular circuit in recording position.

New Self-Contained Molding Press

The French Oil Mill Machinery Co., Piqua, Ohio, announces a new molding press with many unusual features. This press is entirely self-contained and there are no exposed hydraulic connections of any kind except the main ram. The pump, the press cylinder, all valves, and all pipe and fittings are built into the base of the machine. An end mounted motor is used for driving the variable displacement pump. This unit has been built in 75- and 150-tons capacity and the same equipment is being produced in 500-tons capacity.

The press is of the conventional semi-automatic type with the top knockout operated by the platen when it reaches its lowest position. The bottom knock-



out is operated by the pullback effort of the press, and the lower knockout is released by means of a lever. The press has telescoping steam connections.

In the operation of the press the operator moves the ball lever to the left. This lever requires very little effort to move it. The press closes rapidly to a desired point which can be adjusted for any given set-up. The press will then automatically slow down to a pressing speed and usually this point of slowing down is just at the point when the die comes against the material. The pump supplies the necessary pressure for closing the die, and when this pressure is attained the pump holds this constant pressure during the remainder of the curing cycle.

This maximum pressure may be adjusted as desired by means of the hand wheel on the front of the reservoir. There is an advantage in having adjustable pressure because if small molds are placed in the press they might be damaged at higher pressures.

At the end of the curing cycle the operator throws the control lever to the right, and the press during the first part of the return movement opens slowly. It then automatically speeds up and the remainder of the opening stroke takes place at a high speed.

When the press is fully opened, the pump is automatically bypassed at no pressure, which assures quieter operation and longer life to the pumping unit.

In the center of the hand wheel on the front of the press there is also a second auxiliary pump control which regulates the discharge from the pump. By means of this control the speed of the press may be adjusted as desired.

The presses are also furnished with automatic timing controls. With this equipment the operator throws the ball lever to the left, the press closes rapidly to a predetermined point and then slows down automatically to pressing speed the same as mentioned above. The pump builds up the desired pressure and maintains this pressure for a predetermined time. At the end of this time the press automatically reverses the process as described above.

It is pointed out, with this type of equipment there can be no unsightly leaks because any leaks that might occur in any part of the hydraulic system are within the reservoir itself.

Keeping Posted

Reynolds Spring Co., Jackson, Mich., announces the appointment of J. S. Miller, as manager of the Cleveland, Ohio, office. His headquarters will be at 13225 Shaker Square, telephone, Cedar 2949.

At the Commencement of the University of Pittsburgh on June 5, the honorary degree of Doctor of Science was conferred on **William A. Hamor,** assistant director of Mellon Institute of Industrial Research.

The **Farrel-Birmingham Company, Inc.,** Ansonia, Conn., announces the addition of Walter L. Tann to its engineering department. To his new post Mr. Tann brings a diversified experience in various phases of mechanical engineering and industrial management, acquired in several lines, particularly on heavy hoisting, material handling and hydraulic machinery.

We regret statement made in the May issue with reference to powder boxes made by **Ray Sales, Inc.** The box and cover are not cut from rod and tubular stock but are individual castings, made by the Bakelite Corp.—EDITOR.

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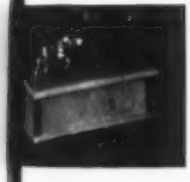

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CELLULOSE NITRATE PLASTICS for WRAPPING PIPE LINES

(*Continued from page 33*) -ping intact and unharmed. On the whole the experiments gave such gratifying results that an engineer with the pipe line company made a detailed and optimistic report to the Committee on Corrosion Prevention of the American Petroleum Institute, of which C. R. Weidner is chairman. The report began with these words:

"An approach to the ideal shield appears to be Pyralin. It has provided permanent shielding for a period of three years at Spindle Top Gully (Texas oil field). This material apparently has the required rigidity and yet is pliable enough to permit easy application. Since we may conclude that the protective life of a coating is almost entirely dependent upon the shield, it was decided that a cold coating, when used with Pyralin, would be satisfactory."

The report states that in the experiments several applications were made of 6-inch and 8-inch pipe lines. The thickness selected as the most favorable for durability and convenience of application was 10 mils (ten one-thousandths of an inch). Later, however, thicknesses of 15 and 20 mils were used under the same soil and atmospheric conditions and these later experiments are still in progress. Each thickness is being checked against the other to ascertain the exact thickness which will give the most satisfactory service.

In discussing the method of application of cellulose nitrate plastic, the report states that after some experimenting the spiral buttlap wrap was accepted as the best method. It not only provided a much tighter assembly, but proved to be more rapid than the straight-away method. When spot welds or other small metal patches were encountered the ellulose nitrate plastic was cut to allow them to project through, thereby preserving the wrapping angle. These places were then repaired by softening a piece of cellulose nitrate plastic with a water-alcohol solution and forming it over the obstacle. However, as the plastic is spiralled around the pipe, a quick-setting cement, made by the same company that manufactures the wrapping, was applied with a hand brush to the edge of roll.

The spiral wrap was not continued over circumferential welds because the wrapping angle would be disturbed. The resulting exposed weld was repaired with a strip of cellulose nitrate plastic softened and formed to fit. The same method was adopted over valves and joints, as it was found that the softened plastic would make a perfect coating that sets up in from 10 to 20 minutes and that in hardening will shrink about 12 per cent in length—stretching without cracking—making it adhere closely to the valves and joints.

Half soles and three-quarter soles did not present a problem. However, an unfilled space between the shield and the coating existed at the edges of the soles, which, on the applications made up to the early part of November, when the report was made, was not filled. At that time it was proposed to use a coating of liquid cellulose nitrate plastic over the paint on future experiments whenever the shield, due to bridging, would not fit tightly.

Commenting on the use of paint and field repair jobs, the report stated that the use of but one kind of paint with slow and fast drying solvents for the entire application eliminates the necessity of the cumbersome equipment required for hot coatings; the apparently critical temperatures required for pouring to produce good bond, and the fear of injury from burns. On the field jobs, the report adds: "It reduced the number of men required and the cost of application as compared to hot coatings. The necessary equipment is limited to a can of paint, two cans of solvent, a paint brush and a roll of Pyralin."

Going into the details of applying the paint, the report explains that the application consists of a first coat thinned with about 25 per cent naphtha to obtain drying from 10 to 15 minutes. A second coat of uncut paint was then applied and, if weather conditions are favorable, it will dry sufficiently in 15 minutes to permit application of the third coat. If conditions are not favorable for rapid drying, the second coat will have to be cut with naphtha.

About three per cent slow or non-drying oil was added to the uncut paint for a third coat. The purpose of this oil was not only to slow up or prevent hardening, but to eventually permeate the second and first coats and reduce them to a plastic state. It is possible that future applications of this type will be limited to but two coats, the first and third, as the only value attached to the second coat was the additional thickness obtained. To further insure the paint remaining plastic, and to hasten application, the cellulose nitrate plastic was spiral butt wrapped immediately after applying the third coat.

Pyralin is inflammable and flashes at 525 degrees F., but the pipe line company in taking due precautions in storing it in a dark well ventilated warehouse, does not anticipate any danger from fire. It is also known that when Pyralin is exposed to the atmosphere for a long period it will absorb enough oxygen to become brittle and eventually crack. In field work, the Pyralin covered pipe is replaced in the ground soon as possible. If it is necessary to hold the pipe above ground for several days, the workmen place tar paper over the pipe to reduce the embrittling action of the sun on the Pyralin. This is not so necessary in the north as it is in Texas, where high surface temperatures are caused by the intense heat of the sun.

The **C. J. Tagliabue Mfg. Co.,** Brooklyn, N. Y., manufacturers of Temperature, Pressure, Flow, Humidity, Time and Level Instruments, announces the appointment of E. D. Wacker, as assistant general sales manager. Mr. Wacker has been with the company for 11 years, part of the time as manager of the Pittsburgh territory.

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"Headache" powders

Makalot has never laid sacrifices at the alter of the Great God, Volume. We prefer to see that each run of Makalot fits—exactly—the particular requirements of the job at hand. Perhaps this is why Makalot's special materials have won such favor with molders. We call them "headache" powders because they end the molders' headaches. Particularly noteworthy are our Numbers 66-E and 662-B, shock-resisting materials, combining great strength with perfect finish. They are practically as strong as canvas filled materials and where finish is important, they cannot be approached by any others.

High heats are tricky

Most so-called high-heat resisting molding powders stick and stain. And few give the sort of finish you care to associate with your product. But when you mold heater plugs of MAKALOT High-Heat, your troubles are over. You know that the plugs will look like new even after a year or more of constant service and abuse. It's a MAKALOT trick that requires no trick-molding to accomplish.

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Our neighbors complain that the MAKALOT plant is always cluttering up the streets with new machinery awaiting installation. We are sorry about that, but MAKALOT demand has again required a building operation at our plant. This time we've installed additional rolls, ball mills and one of the largest blenders ever built. That means that your molder can promise delivery and be certain we will back him up with materials.
Noteworthy in the growth of demand for MAKALOT is the fact that this has not been achieved by price cutting. While MAKALOT prices compare favorably with all others, our orders have come to us because our material was considered better—by molders and molding users. Maybe there's something in the "better mousetrap" story after all.

Your job, your costs...and MAKALOT

You may not be a molder . . . or even a technician. But you know that faster cure, better flow, smoother finish, greater strength . . . all these spell extra sales and extra savings for you. Your molder will gladly run a comparative test of MAKALOT on your job . . . if you give him permission to do so. We, on the other hand, will gladly cooperate with you and with him in finding the ideal solution to your problems. Speak to your molder about MAKALOT. Or write today to—

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Included in the Monsanto list are products that find an increasingly wide application in America's major industries. An opportunity to furnish service data and discuss your present or potential requirements will be appreciated. Such discussions are often mutually advantageous.

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Chemicals

49,000,000 IMPACTS!

(*Continued from page 32*) and designers know, the life and accuracy of this class of instrument. Therefore, to insure life and accuracy of a high speed counter, the flexibility and weight of the material from which it is made plays a very important role.

"Our accumulation of experience over a period of years, experiments with metals and zinc alloys, has shown that the revolving members of a high-speed instrument of this description require a light, rugged material, capable of withstanding millions of impacts at speeds varying from 300 to 1800 per minute. The solution of our problem was found several years ago in the use of Phenolic molded wheels, with very gratifying results. This particular material was selected because of its durability, ruggedness and light weight. The light weight of the counter wheels affords a reduction in operating costs.

"From time to time we have carried on very careful speed tests in order to determine the wearing qualities of molded plastics, over various other materials, at designated speeds. We have found that in every instance the molded plastics are much more desirable.

"At the present time we are conducting a breakdown test in which a mechanical counter and an electrical counter are both equipped with plastic wheels. The instruments are running at a speed of 516 per minute. The total registration on April 1 was 49,186,740, with an error of only 2 between each counter.

"The ratchet teeth on both counters are in excellent condition, showing little or no wear, and are easily capable of 50 million more impulses. Several years of experimentation on molded ratcheting devices indicate to me the vast possibilities manufacturers will find in molded units."

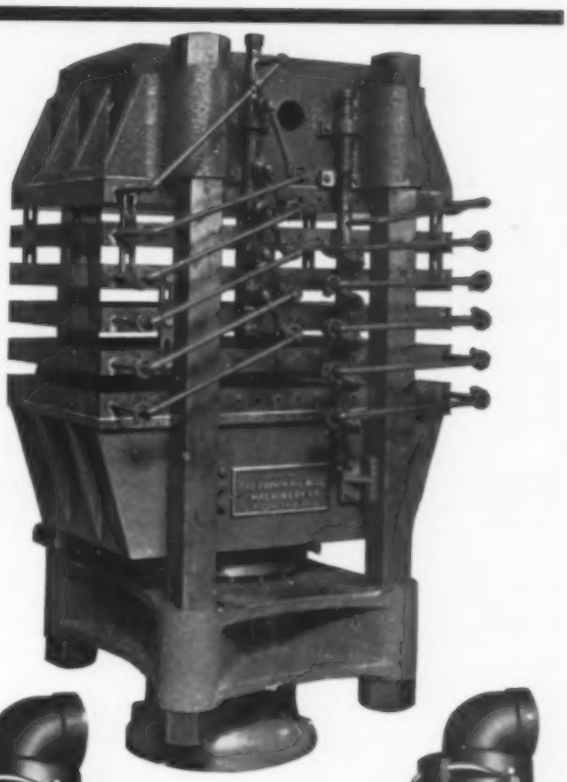
Today, as for several years past, all counter wheels made by the Production Instrument Company are being molded of plastics. Here, in a field where accuracy and freedom from breakdown at high speeds is of paramount importance, plastics once again prove their ability to stand up to and excel other, older materials.

Credit: To Bakelite Corporation for phenolic materials used in molding wheels and base. To Midwest Molding and Mfg. Co. for molding.

SEEING THE READY-MADE HOUSE

(*Continued from page 19*) stack is located at the point to which the various service lines have been brought, and this takes care of the functions that are ordinarily housed in a basement. The heating is assumed to be by oil furnace and the house is assumed to be from one to three stories.

As for the social aspect of such mass housing, Corbitt feels as does Ralph Walker, that the trend is toward the impersonal and away from the individual; that, in the final analysis, the efficiency of a house as a machine in which to eat and sleep, will determine its acceptance rather than its picturesque differences from its neigh-



Swivel 7AS-8CS

PREVENT STEAM LOSSES AND SHUT DOWNS *with*

Swivel 7AS-8BS

BARCO

Swivel Joints

Automatic take-up is the feature of Barco Swivel Joints which, by preventing steam losses and leaks, provides uninterrupted production. Barco Joints permit full swivel movement with no tendency to bind. They are spring-seated with stainless steel springs and do not leak under alternating steam and cold water action.

The positive testimony of re-orders proves the satisfaction and economy of Barco Joints on the molds and presses of the plastic industry.

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1813 Winnemac Avenue, Chicago, Illinois

Swivel 7S-8CS

SEND FOR CATALOG NO. 254.

Swivel 7S-8BS

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Use **CHEMICALS** *of Uniform Strength*

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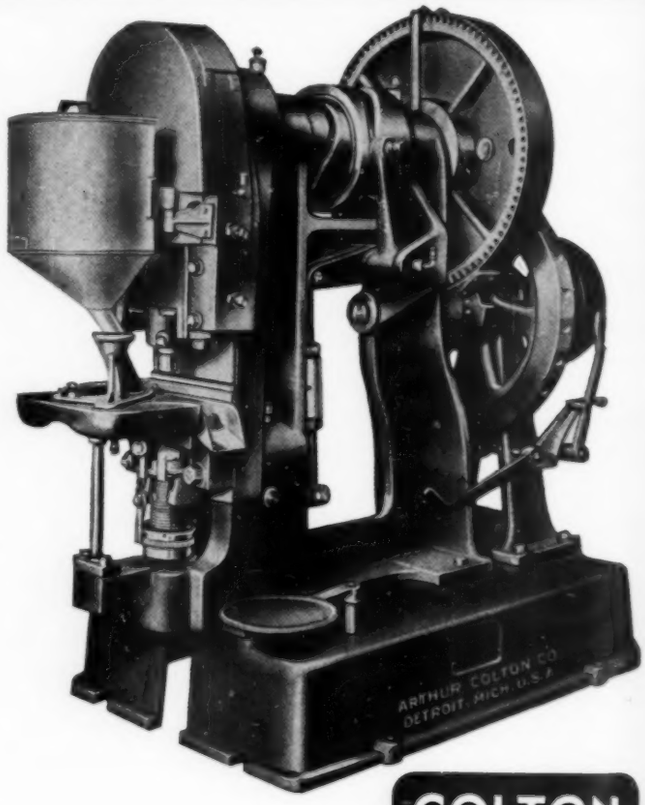

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COLTON
DETROIT

bors: that at present, their automobiles are both a greater necessity and a greater pleasure to the masses than their houses: that we have become, or reverted to being, a nomadic people. With the exception of a few classes of workers, it is impossible for most of us to establish homes where we live for any long period of time or for any great part of any given day. For one's work and one's play, one usually goes out of the house.

To those who immediately and resentfully raise the accusing shout of regimentation, Mr. Corbett has two answers: first, that it is well to consider the present unregimented state of affairs before shouting: second, that there is ample scope for variety within the limits of this regimentation. In his own words, "It all depends on how these things are designed; how much intelligence is used in putting them into place. You are not worried if you are driving along in your Cadillac car because you see another Cadillac car." Again, of nonstandardization, "Is the result as you go through the country so highly satisfactory from an aesthetic and architectural viewpoint? When you go in the environs of most of our towns where people live are you delighted and impressed with the architectural beauty of it? I think a little standardization might be a great relief!" Mr. Corbett maintains that were a housing development of fifty houses offered to an architect with the single restriction that every house must be built of red brick, the result would be pleasant however wide the range of designs, simply because there would be a common denominator which in itself was of pleasing proportions. The proportions of a unit will largely determine the proportions of the masses constructed with it. And the rigidity of the unit in such an instance becomes a decided asset.

"Of course we will see a lot of ugliness, as we already have in this new movement in architecture, but have we avoided ugliness in following the old models? Walk through the streets of New York anytime. If you have a keen knowledge of classic forms, their proportion, their use, are you delighted with the sort of things you see in nine buildings out of ten, where all those things have been misused because the men who created them had no creative or architectural skill, but were just copying?" ..."In this new movement we are going to get just as much ugliness and we are going to get it at the hands of every man who isn't an artist. But the new movement in the hands of the men who know what they are doing, who have an appreciation of form and mass and color and material is going to produce things which are as fine and possibly finer than anything the world has yet seen, and it will be infinitely more expressive of this time and period, this age and this civilization. It is important to keep your minds open in order to make the most of our architectural opportunities." "In Colonial days, if we may judge by the remaining examples that we still have left, men built not only with respect for their neighbors but with regard for the community as a whole. A flagrant effort of individualism would have been frowned upon by everybody and the

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author ostracized for his evidence of bad taste. On the other hand, each building had its personal interest and charm—there was no lack of individuality but it was never an offensive or blatant individuality."

"For the last twenty-five years we have been taking European designs and trying to adapt them to modern American conditions—we cannot revert to a previous time or age, no matter how much we may talk about it and admire it! We must go on and the only way to go on intelligently is to try to understand what those forces are that are directing this, our time and period. Perhaps then we can get hold of them in some way and begin to guide them in a direction that will be productive of a better state, a finer setting, a higher development of art, and greater appreciation of beauty. If we think of it from that angle I believe we can be as artists, constructive rather than destructive. We can create a demand for an art that is alive and part of us, rather than the demand that exists today for nothing but antiques." The vital factor in architectural beauty is a sense of order, only possible through intelligently guided community effort.

Mr. Corbett stresses the fact that buildings of the Middle Ages and Rennaissance were machines functioning as fortresses and indications of prestige. Those of today have other functions and therefore must be constructed differently and designed differently, to properly fill those new functions.

It follows that for those persons mechanically interested in design of their houses, there are opportunities offered by the prefabricated house impossible to the usual methods. The greatest problem an architect has today in deciding the plan of a house with a client, is that of making clear to him by a drawing on a flat piece of paper what the building is going to be like in three dimensions and materials. A solution constructed in miniature units of the prefabricated house should be more easily understood and take a less time to work out.

Furthermore—with present construction methods, once a house is erected, you've got it, and if you don't like it, it is just too bad. Remodeling is always expensive, and some things cannot be remedied. With the prefabricated house however, one should have the same advantages one has with a car—you can turn in the old model and get a new one; or you can alter the old one adding to it for additional members of the family or to indicate greater affluence. And since it is all done by units—this cannot possibly be an expensive process. Your opportunities for trying out your ideas of convenience and style are almost unlimited. Your limits are specifically the form and material of your units. Synthetic plastics—photographically reproducing marbles, impregnating wood veneers and fabrics, developing a wide range of colors—would seem an ideal material to employ.

There are style limitations obviously. But since Gothic design was the logical outcome of available materials, available methods of construction and an

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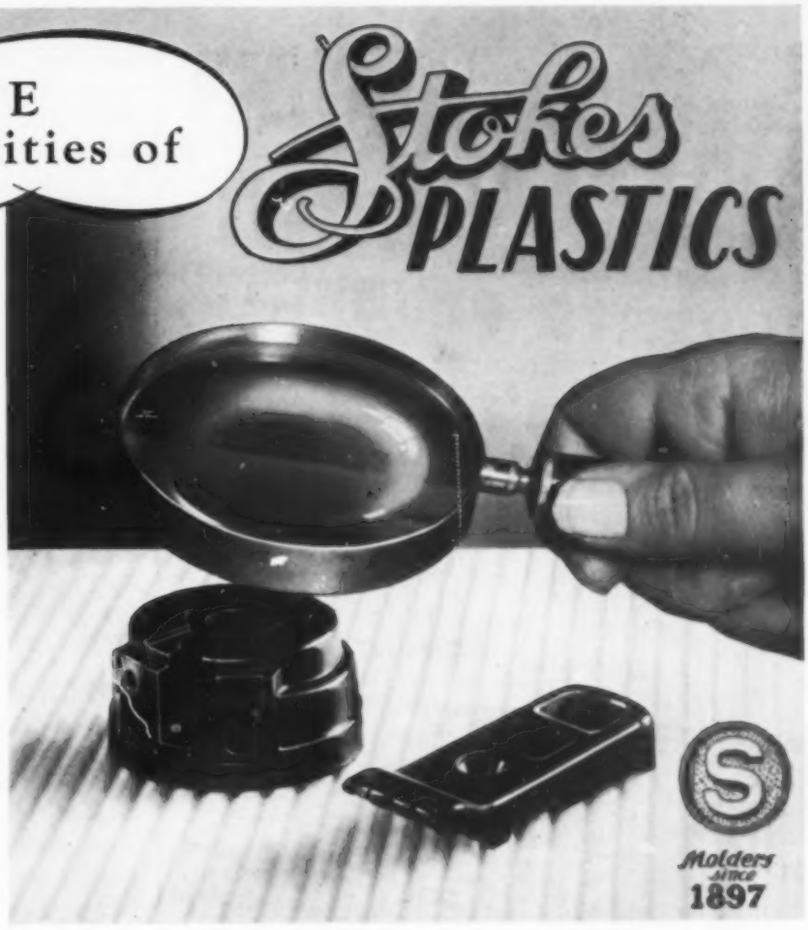

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aesthetic conception conditioned by the social economic and political conditions of the time; Colonial design, the result of the same logical relations, it does seem reasonable to assume that a new method of construction and new materials will again arrive at a new style of design. But, just as the Colonial style is no less charming because it is more modern than the Gothic, and intrinsically different, there is no reason why the style that may result from the use of prefabricated units and synthetic materials cannot be equal in charm and as efficient in relation to its own time and conditions. Of course it will be a new style—it will have to be. A vision of a Colonial house imitated in steel units and synthetic resins, is quite terrible, for the same relationship between idea, material, construction and function must be achieved before the same degree of beauty is achieved. Beauty is certainly not a matter of moldings; it is the intelligent correlation by the designer of his materials, thinking directly in terms of form mass and color, not in terms of photographs or imitations.

This is not to say that the spirit and charm of Romanesque, Colonial and Classic periods will not recurr—but that it cannot be imitated as to its materials and result in good design. The belief that the public can and will be sold rests on the demonstrated public reactions to automobiles, radios, aviation, skyscrapers, apartments—to a host of developments unconceived by the public mind fifty years ago, but accepted with nonchalant ease.

Prefabricated housing constructed in standardized units of synthetic materials will be sold in the same way and for the same reasons as automobiles. While the automobile remained a "horseless carriage" it met a definite public opposition—because it was a graceless and unconvincing substitute. Designed to imitate the appearance of a carriage, the absence of any horses was the first thing one realized—not the power of the motor; what it lacked rather than what it offered. In time two things happened. People learned to consider the motor car as a different kind of a machine from a horse carriage, offering greater functional advantages; and the design of the cars began to be based on the mechanical nature of the machine and the materials used in its construction. Certainly it would be hard to find today any audible regrets that automobiles are so aesthetically unsatisfactory that they cannot be used despite their mechanical advantages.

Similarly buildings today which apply a veneer of brick or stone to steel construction, seem illogical and unsatisfying because we are calling attention to what they lack rather than what they have. They are not constructed of two foot thick walls, and every window opening makes it obvious. They are not a series of masses supporting each other. An architect's studies in plaster or the inspired sketches of Hugh Ferris are always slightly different from the actual building that results from them. Steel construction has not as yet been interpreted in terms of architecture. Nor will it be un-

til there are tangible demonstrations on a small scale of a logical approach.

This can be done in the prefabricated house, and it is therefore of essential interest to those engaged in the manufacture of building materials to study the relation of their materials to steel construction and demonstrate as tangibly as possible the fitness of their materials, aesthetically and mechanically, for the adequate solution of today's housing problems. These materials again, must develop their own intrinsic merits as opposed to their imitative possibilities.

The approach to housing design for the immediate future must rest upon an understanding of the necessities of a mechanized existence and both the style and beauties of the style developed through a real artist's skill in handling mass—color—texture.

The use of synthetic plastics in prefabricated housing is logical and appropriate since, obviously, materials so used should resist fire, water, chemical action and weather; be sanitary, durable, capable of prefabrication in housing parts, versatile, inexpensive, light in weight, and agreeable as to color and texture.

There can be no question as to the qualities of resistance inherent in synthetic plastics; their durability when bonded to less brittle materials; their versatility and their light weight. There remain the problems of cost, methods of application, and their finishes particularly in regard to texture.

It is Mr. Corbett's conviction that in their potential adaptability to housing prefabrication, lies the great future of synthetic plastics—a future which they will inevitably realize and which will prove a greater market than those at present being developed. It is necessary for some manufacturer in the industry with enough capital to stand the cost of experimentation, enough imagination to visualize the result, and enough technical ability available, to help solve the practical problems of manufacturing steel or other metal units with resin impregnated surfaces on a mass production basis that brings the cost to a usable minimum.

It is vital, to Mr. Corbett's mind, that one grasp the essential facts of progress—that it is the tendency of hand made things to give decreasing real value at increasing cost, and that it is the tendency of machine made things to give increasing real value at decreasing cost—due to increasingly efficient organization of the processes involved.

The cost aspect of synthetic resin materials or their present limitations do not therefore perturb Mr. Corbett. He is confident that once the actuality—and potentiality—of the housing market is realized, means will be found to solve the problems now existing. The present qualities of resins, their range in colors and effects, their lightness of weight, their adaptability, their durability—all indicate intrinsic merits that must logically be used in the further development of modern architecture.

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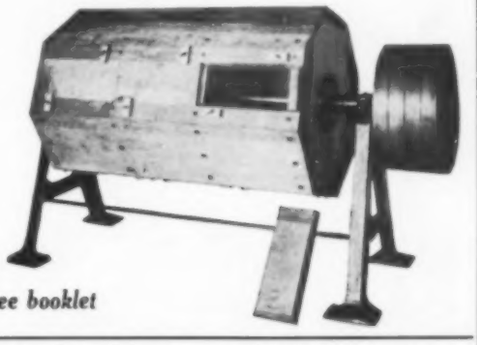

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PLASTICS IN THE PAPER INDUSTRY

(*Continued from page 25*) is important because the highly polished drums oxidize easily.

Plastic doctor blades have been used to advantage on all rolls of paper machines requiring blades, from the bottom rolls at the wet end to the steam heated calendar rolls. The life of a blade properly installed should be two years or more.

Blades may be had either with straight sawed or beveled edges. Any thickness from $^1/_8$ inch to $^1/_2$ inch is available up to 300 inches in length. The long lengths give the advantage of a continuous unbroken wearing surface, and simplifies mounting.

Hundreds of these doctor blades now in service have proven their superiority by reducing costs of maintenance, wearing longer, and cleaning better.

The covering of aluminum table rolls for Fourdrinier machines make for a greatly improved unit. Plastics are not attacked chemically by weak pulp solutions, although absorbed moisture causes a small overall expansion. This does no harm when the design of the apparatus takes this characteristic into account. Its weight being one-half as much as aluminum gives decided advantages over heavy brass sleeved rolls. This weight reduction can be appreciated on balance at speeds from 800 to 1200 feet per minute peripheral speed.

In addition to light weight, the wear on the wire is reduced because of the lower frictional surface and the lower power required to turn the lighter roll. The pulp stock has little affinity for the treated surface and consequently reduces spoiled sheets and plugged wires. Covered rolls eliminate any electrolytic action which is so detrimental to good wire life.

There are numerous other places in the paper mill where laminated materials fit into the picture very nicely. The use of plastics for shake springs, toe blocks, bearings, and many other applications is well-established and there is a very definite place for this material in the mills of both the Fourdrinier and the cylinder types.

PLANNING AHEAD

(*Continued from page 15*) the best ideas in its construction become a definite certainty, then plastics and other new materials can be embodied in its construction, but not until it is sufficiently along to warrant mold costs and other items of initial expense which can be amortized over the period after it has been proven acceptable.

In due time these prefabricated homes will embody the essence of those finer homes which, through mass production, will be available to the 75% at a price well within their reach.

Let the skeptics recall the early days of the automobile if they must be convinced.

"Where I have used plastics in the past," says Mr. Rohde, "is not nearly as important to the industry as

the plans I have helped create for their use and acceptance in the future."

"Before any product can employ the use of plastics to financial advantage, there must be reasonable assurance of mass acceptance to cover mold costs. It is not the material for pioneering but it has the qualities of permanence which will make its eventual use an important part of this mass production program. Industry should take cognizance not only of plastics, but of design forms in other materials which are well adapted to fabrication in plastics and thus lead to the acceptance of forms which eventually will be produced in plastics.

"Production of forms suitable to plastics, 'though at first not made of plastics, is desirable, but industry as a whole is unaware of this fact. Even clocks which are now made of wood, metal and glass are forms well adapted to plastic material. But in the beginning, manufacturers couldn't afford to make molds—even

In this drawing of a clock for Herman Miller Clock Co., Mr. Rohde makes the most of the reflective power of plastics by making the face of the clock slightly concave and engraving very fine eccentric circles upon it. The effect produced is similar to that on a phonograph record

two years ago—but they can now because forms have been proven acceptable and plastics have been made available for the purpose at reasonable costs."

In designing clocks for the Herman Miller Clock Company two years ago, Mr. Rohde believes it would have been comparatively easy to have persuaded them to use plastics. But there was insufficient evidence that current designs would be permanent enough to warrant mold costs. He could not afford to chance his reputation by suggesting it. In this year's redesign, those of

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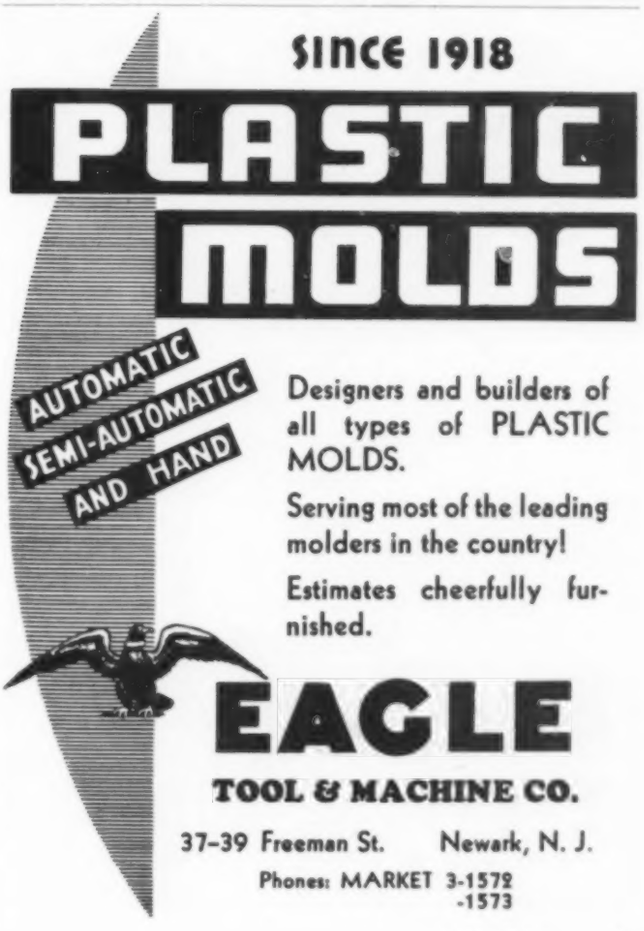

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definite acceptance can and will be made of plastic material wherever practical.

"In the case of small clocks, small products and small parts of furniture," continues Mr. Rohde, "plastics are fairly well on their way to established success. But the important development, which will increase tonnage of the material and make big molders out of small ones, is for larger objects which can be made of cruder, cheaper material, and the development of methods of fabricating where less expensive molds can be employed to produce big pieces for furniture and like articles. No manufacturer will gamble the present expense until his product has been tried out in other materials of less cost—to make sure of its public acceptance."

Among other things, Mr. Rohde designs furniture that this 75 per cent can have and enjoy through mass production. They do not have to wish for them, they are now within reach. One big reason for the slow acceptance of modern furniture has been that most of that which has been offered within a reasonable price range, has been atrociously designed. Pieces of good design have been made only for the 25 per cent of our population who can afford such luxury. Those who admired modern but could not afford the expensive prices were forced to choose between accepting mediocre imitations both poorly designed and manufactured, or abandon their desires and go without.

This situation is no longer true. Kroehler Manufacturing Company makes furniture in mass production. Until now, no one has made modern furniture comparable in design and quality to that which has been so popular in maple. No manufacturer would do it. Kroehler was the first to introduce a complete low cost line of well-designed modern furniture for every room in the house and all so grouped as to be interchangeable.

In aesthetic design, in quality construction, they meet every ideal attributable to the furnishings of those finer homes, but made of American Oak in tremendous quantities, they are available to the 75 per cent without undue strain on their carefully planned budgets. This is a brand new step taken in January this year, and conceived along entirely original lines without respect to dead material or what has been used before. Mr. Rohde designed Kroehler modern furniture on a basis of an estimate of an observing premise of people's needs. He started afresh from present standards of people's living, taking into consideration the inefficient type of present furniture.

Ten years ago no manufacturer would listen to a designer who suggested such ideas. Now they listen and are interested.

Plastics are not used in this present venture, but their future is definitely planned. The 75 per cent public must first be prepared to accept the new forms before initial mold costs will be a practical investment. Once these forms are established and their acceptance assured, plastic will replace many parts now made of oak, and their use will be a financial success.

IS THE PREMIUM FIELD A PLASTICS FIELD?

(*Continued from page 34*) *molded* cigarette humidor.

5. To encourage more frequent use of consumption of the product.

   Example. The Wander Co.'s use of the Orphan Annie plastic drinking mug.
   Cudahy Packing Co.'s use of a rubber cleaning sponge a replica of the Old Dutch.

6. To minimize substitution.

   Example. Packing of coupons in the product offering a premium for a number of coupons, thus creating what might be termed "sales insurance."

7. To get the interest of children.

   There is no question about the fact that a premium plan is one of the most successful ways of enlisting children's interest in a manufacturer's products and service. This does not only affect the product which has a pure appeal to children but other products such as soap, food products, and plastics lend themselves to this particular appeal very well indeed. There are many articles made of plastic that have an interesting child appeal.

8. To get consumers to buy a "family" of products.

   This particular use is the coupon plan, coupons being given with all of an associated group of products, the premium being offered for the return of varied accumulations of coupons.

9. To induce people to try the product.

   Again plastics play a large part for this particular purpose and in a like way, can be produced inexpensively. Plastics can be mailed and used very successfully to induce a use of a new product.

10. Special Christmas offer.

    Example. H. H. Heinz Co.'s use of a miniature reproduction of a Heinz Truck on a cash and purchase privilege plan.

11. The tie-in with special sales events.

    The introduction of a special premium. Plastics again come forward in this connection, of celebrating the *special sales week*.

12. To capitalize on cooking school attendance.

    The idea of giving away something useful to the housewife in attendance at a cooking school either with the purchase of a product there or at a neighborhood store.

Plastics, cleverly used, as in this famous shaker-mug developed in cooperation with The Wander Company for the promotion of Ovaltine, can create a public demand for other merchandise at an extremely low cost. But the planning and design of plastic premiums call for skill and understanding that comes only with experience. Many of the most widely used premium successes of recent years are Kurz-Kasch products. The experience, the ideas, the skill this work has brought us are available to aid you in formulating your plans. Investigate. Write—

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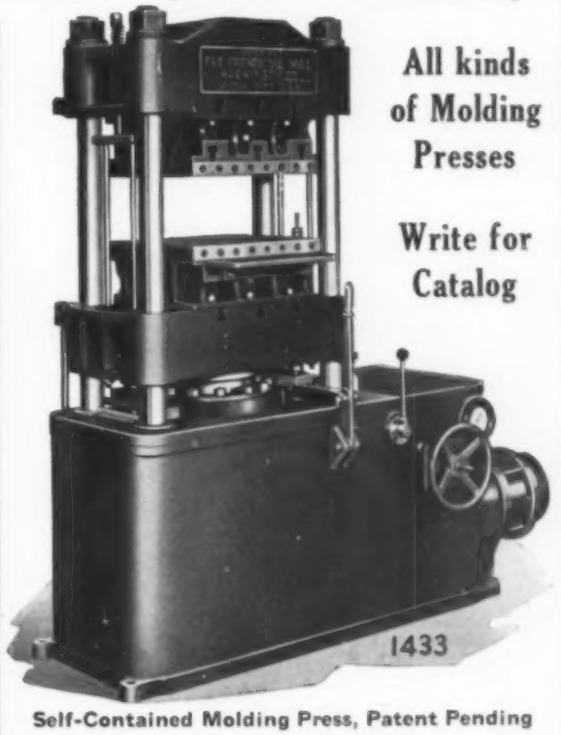

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13. In checking radio programs.

The largest use of low-priced, light-weight premiums is for the particular purpose of checking the listening audience of a radio program. Plastic premiums of a special nature, or those from stock molds, preferably below $0.06 in cost (and as much below it as possible), can be used and have been used most effectively for this purpose.

It is obvious that here is a field which offers the plastics molder or fabricator unusual possibilities for sales; a field which offers the premium user unusual opportunities for profits through the appeal of plastic premiums. When these have gotten together, when they have ironed out all the kinks in a premium plan—as in the many instances cited—plastics have demonstrated their unusual consumer appeal.

It is well to recognize the great progress which plastics have already achieved in this field. It is equally pertinent, however, to point out the limitations of that progress at its present stage. For, with some outstanding exceptions, the plastics producers have not met the premium challenge. To achieve plastics' fullest possibilities in the premium field, molders and fabricators must learn to supply better designs better fitted to the premium merchandiser's problems. Particularly must they supply an increasing number of low cost, easily mailed items of high intrinsic usefulness. All three of these qualities are inherent in plastics. It remains for the plastics supplier to synthesize them, again and again, into premiums that will "click" with the public as instantly as have the Brown and Williamson humidors, premiums that will continue to "pull" as long as has the famous Orphan Annie mug.

FOR BEAUTY AND FOR PERMANENCE

(*Continued from page 16*) -mediately above. The two sections are connected by a small elevator, the shaft of which, necessarily, provides the center of attraction for the eyes of those entering from the street.

Architects Reinhard and Hofmeister found their major problem to be one of surface decoration. To this end, it was decided to cover the showroom walls with leather in white, red and green, the colors of the Italian flag. Upon this base, a display consisting of the Line's coat of arms and name was planned on either face of the elevator shaft, as a central focus of interest for the room. At the time of planning, a number of materials were being considered, in particular wrought iron and bronze. At this point, the possibilities of using cast resins were suggested by J. H. Tyson and Staff, and a study of comparative costs was made. This showed so marked a balance in favor of the plastic material that its choice became inevitable.

A number of rigid requirements were set. Colors had to be exact and fast. The material had to be rigidly guaranteed. This was likewise demanded of

the workmanship involved in fabrication and installation. Thus all responsibility for the success of the material was thrown, rightly, upon the material manufacturer and fabricator jointly.

The display, as may be seen in the accompanying illustration, consists of four replicas of the Italian Line's emblem, each two feet in diameter. The outer circular border is of black and the field of alternating red and white. Two of these plaques involved a reversal of the design. Specifications called for a "glass-finish" polish. Between each pair of plaques, the words "Italian Line" were formed in script letters, the initial capitals being three feet high and the other letters in proportion. The entire name has a relief depth of two inches and, here again, specifications called for a glass finish.

Special castings, special machining and great care in installation were required, both by the nature of the job and by the rigidity of the specifications. As is true in all pioneering work of this order, costs were undoubtedly higher than they would normally be, once standardized methods of procedure have been worked out. Yet, in spite of such factors, it is worthy of note that the cast material successfully competed, on a cost basis, with two such long established decorative media as wrought iron and bronze.

Having won on this ground alone, cast resins provided the added advantages of integral and brilliant coloring, high finish and lustre and a delicacy and warmth not possible of attainment in metals. The fullest degree to which this beauty has been achieved, may be appreciated when the display is viewed under floodlights. Here, under conditions that would make metal seem harsh and glaring, the cast materials gleam with a soft radiance, thoroughly in keeping with the rest of the decorative scheme and with the nature of the room and its use.

Credit: To Reinhard and Hofmeister, Architects, and John Lowry, Inc., General Contractors, for general and detailed decorative plan.

To American Catalin Corp., for materials and special casting work.

To J. H. Tyson and Staff, for fabrication and installation.

CLEAN CONVERSATION

(*Continued from page 17*)

All of the parts, when in position, form a unit of extremely neat appearance which, being in color and texture identical to the molded telephone itself, is thoroughly unobtrusive. For those still using the upright rather than the French or cradle type telephone, a different shaped base has also been molded. This fits snugly into the standard conical mouthpiece.

Credit: To Bakelite Corporation, for black phenolic resin used.

To Boonton Molding Company for engineering and molding.

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MOLDINGS GET LARGER

(*Continued from page 21*) the Andis Products Corp. to molded phenolic parts for the whipper was their lighter weight, the impossibility of chipping the impervious, wear-proof finish produced in the mold.

There are other similar instances in the illustration. The larger radio cabinet shown was competitive in price with a wood cabinet, because the design called for side flutes and a pyramid top which would have been costly to machine in wood but which were automatically molded in with plastics. The telephone bell box is another similar case. Formerly a metal stamping, it required extra die work for punching out holes in the sides, and extra finishing operations to try to get an enamel finish to stand the gaff of bumping furniture. Both of these operations were eliminated by molding, thus making the costs competitive. Right now, there is being molded for a weighing scale a very large plastic case which used to be made of porcelain. Elimination of handling, baking, machining and other operations made the cost of the molded case compare favorably with porcelain, although the latter is a much less expensive raw material. In other words, only when a molding eliminates costly finishing, assembly or machining operations does its cost compare with older and cheaper materials, be it wood, metal, etc.

It's true there are many times when the function or performance of a molded piece makes it preferable to other materials even when its cost is the same or higher. The molded phenolic case of the electroplating device was chosen, not because it was less expensive, but because it was lighter in weight than a casting and helped the manufacturer's portability argument, because it was self-insulating, and because it resisted the splash of plating acids better than enamel. Similarly, the molded instrument case didn't necessarily cost less, but it resists laboratory fumes and acids better than a cast metal case and its finish can't wear, chip or peel off. The molded Lazy Susan restaurant server wasn't less costly than a stamping, but no amount of banging with salt shakers or ketchup bottles could chip or dent it.

A good instance of eliminating assembly operations and thus reducing the relative cost of finished moldings can be found in the recent trend toward molding cameras and pocket-projectors of plastics. Even though they are not large pieces, the same rules apply. Cameras were formerly made of 70–100 different metal and paper pieces, riveted, glued and screwed together, and although they were all cheaper materials than the lowest priced molding compound, they required a whole battery of assembly girls and finishers to make up. Today a former 74 piece camera is made of three moldings, and a former 33 piece projector is made of five moldings, all by combining a variety of fittings, bezels, partitions, and parts into a single pre-finished molding.

As for the future, it seems obvious that moldings will become larger and larger as strengths and molding technique improve. Without any improvement, however, there are still many places where large moldings could

be successfully used, where existing strengths are adequate. Recording instrument cases are one, and it is understood that molded ones will appear as soon as new models are released, since it will then involve no scrapping of dies. Many pieces of light machinery, appliances and mechanical tools will soon be appearing in molded plastic housings, especially where they are combined with metal bases or parts for reinforcement. Beauty parlor appliances such as hair-dryers are already using molded housing. Phenolic molding material will soon be used for the tops of the smaller Lift-top refrigerators, and office machines are already appearing in molded cases. Portable dictating machines with molded cases, lighter, smaller and more smoothly contoured, are said to be a coming development, and perhaps smaller portable sewing machines made lighter with molded housings will follow. At any rate, there is much that manufacturers can do with present molding materials to improve their products.

"BETTER THAN GLASS" DECLARE WESTERN UNION ENGINEERS

(*Continued from page 29*) It may be asked, "Why wasn't the more familiar material, glass, used to effect this purpose?"

Here a number of reasons operated in favor of Catalin . . . reasons that will be increasingly recognized by lamp and lighting fixture designers as they become more familiar with the nature of cast resins.

First: glass, being more brittle than Catalin, would be subject to frequent breakage and replacement. This is particularly true of a fixture placed in such an exposed position as were these. Secondly: glass was found to be impractical from a cost standpoint. Catalin is easily cut from sheet stock, easily polished and speedily drilled. Third: the method of attachment required drilling, and again Catalin showed advantages over glass. Smaller holes were possible and, hence, thinner sections overall. In the opinion of the engineers, the use of glass would have required sections of much larger size to permit drilling without too great loss of strength. Finally—and most important—glass would not have been able to produce the soft, glowing effect desired in this installation. The harsh, crystal glare of the one has no comparison to the smooth, even gleam of Catalin.

Thus, Western Union engineers have come to the development of another new application for cast resin . . . a development by no means limited to this single installation. For, as the scientific knowledge of lighting principles progresses, and as sounder and more attractive design finds wider application, the growing recognition of new materials—and particularly cast resins—will in turn call forth newer and more interesting examples of their use. Already, in theatres, in lobbies and in elevator cabs, cast resins have proven their merit. The larger fields of commercial, store and home lighting await only the development work of the engineer and designer.

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